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ARTICLE I.

THE OCCASIONAL SERIOUS RESULTS OF PULP
TREATMENT.

BY F. M. DIXON, D. D. S.

[Read before the Odontological Society of Pennsylvania, February 6th.]

The discussion at a former meeting reminded me of a long contemplated intention, of writing a history of some of the more remarkable experiences of my professional life in the results of pulp extirpation. Believing that in such history there would be found both entertainment and material for profitable discussion, the paper having been written, is now offered for your consideration. It may be remembered, that during the discussion alluded to, it was remarked that the incidental results of root filling were frequently much more serious than most of us apprehended. Let us now see if the correctness of this position may not be amply proven by testimony which the following simple statement

of facts will reveal. Not that imminent danger must necessarily attend at all times, even the most intricate operation needed upon a devitalized tooth, but that such results incident upon either present or subsequent circumstances, do frequently follow root-filling. Such circumstances for instance, as removal of the patient after a recently filled root, still in pathological conditions, out of reach of proper treatment, in case of periosteal inflammation; or falling into the hands of a physician, who, however eminent or successful in general practice, may know positively nothing of the duties he assumes when undertaking those of a speciality which he has never even tried to comprehend.

The first case referred to was that of a young man for whom in the summer of 1854 I treated and removed the pulp of a superior lateral incisor, filling with gold, as was the practice of the time, as nearly as possible to the apical foramen. There was nothing apparent at its completion signifying that trouble was to be apprehended. It was with much surprise, therefore, that upon meeting the patient some days afterwards, I learned that he had been, and was still suffering from the effects of periosteal inflammation, with every indication that an abscess was forming. I advised him, as was I believe the universal practice at the time by those who undertook this kind of operating at all, to apply active fomentations with a view to hastening its termination as rapidly as possible, desiring him to report to me within the next twenty-four hours. Not hearing from him however for a number of days, and supposing that the crisis had passed, I was startled upon hearing that he was ill and under medical treatment. As I was about leaving the city, and the patient being a personal acquaintance, I called the next morning to make inquiry and was much astonished upon learning that during the night he had died of erysipelas of the stomach, as was reported by the physician in attendance. Although it was never supposed that death was caused by the treatment of the tooth of which I had every assurance by the family at the time, and again

very recently, by a brother of the patient who was with him during his illness, yet the question has frequently arisen in my own mind as to whether it was not incidently even the cause of death. In order to reach a fair standpoint from which to judge, let us review the whole train of circumstances as they occurred after the fomentations had been recommended, which advice was not followed, but instead the physician's treatment, of which we have no knowledge, but do know of the agonizing pains frequently experienced during the process of suppuration.

We may naturally suppose that in this case they were exceptionally severe; that the patient's strength was greatly reduced by the rapidly developing but unsuspecting malady; while all the trouble was attributed to the condition of the tooth. At this period the physician was called in; it may have been at the very turning-point when remedial agencies must have proven unavailing, or even to him, there may have been no suspicion of the coming disease. Here then is illustrated the means by which the filled root may have been incident to the disaster; for during all this time the smouldering, unseen fires within were gaining strength, ere while to manifest the fearful ravages, which, unresisted, had been consuming the very vitals and had already gained that force which no human agency could control. Let us remember that erysipelas is but one of many diseases which need to be recognized in their earliest stages and combatted by proper remedies if danger or even death are to be arrested; and also that many thousands of pulpless roots annually filled, many of which remain from a few hours to a number of years so filled, ere manifesting such conditions as might produce results corresponding to those of the cited case. Though the fatal result in this instance might not have been arrested had the patient continued for three days under the dentist's treatment, yet this advantage would have been gained; that he would have known familiarity with the effects of forming abscesses, that the rapidly diminishing strength of the patient was due to something fiercer and

stronger than this ; and that the insidious enemy, whatever it was, must be immediately deprived of its formidable ally, even by removal of the tooth if needs be, and brought at once face to face with the skill that would have immediately discovered its nature and strength and administered timely remedies which, under God, might have worked its overthrow and saved the life of the patient.

He must be a dullard indeed, who would not profit by the experiences of such a case ; as for myself, I have since approached with timidity the treatment of a threatened abscess, never omitting any possible precaution, by which it might be averted, especially where there are the slightest indications of the presence of either chronic or acute disease, which alone might prove to be all that the patient had strength to endure. A few such precautionary measures may be properly admitted here. The first of these was adopted about a year later.

The patient, an invalid, was waited on at her residence. Among the operations performed for her at the time, was one upon a bicuspid, of which the pulp was destroyed and removed and a temporary filling inserted. A few days later the tooth, seeming entirely well, was filled with gold, and for a time promised the best results. Nevertheless, about ten days later violent pains commenced, with other indications of acute periostitis. Upon visiting the patient I found her much prostrated. Whereupon the tooth was extracted and immediately returned to its place. Three days after which, with little or no suffering in the interim, it was perfectly comfortable, remaining so, I believe, until the day of her death, which occurred about twenty-five years later. We may now suppose a possible train of circumstances such as frequently do follow a series of operations resembling essentially those just described, less the extraction and replanting of the tooth, which would have been as likely to produce death, as those which followed the case first described. Supposing that this lady, already physically debilitated by protracted disease, had been visiting at Potts-

ville, where the case occurred, for medical and dental treatment, from a distant region where skilled medical or dental care could not be obtained. Anxious to return to family and friends, she had hurried off immediately upon completion of the last operation, and before the inflammatory conditions appeared. Now out of reach of intelligent treatment, still weak and debilitated from long continued sickness, who, for an instant, will doubt that the added torture of a growing abscess, and possibly blood poisoning, might have shortened her life by the quarter of a century that followed.


In 1862 I was visited by the late B. V. M., merchant of this city, who was suffering from the effects of acute pulpitis of the right inferior third molar. An application of the usual arsenical preparation was made; but in half an hour he returned, suffering so intensely and manifesting symptoms so unusual, that the tooth was unhesitatingly extracted. But being found with a perfectly healthy periosteum, was, by his consent, immediately returned to its socket. Whereupon the patient left with the understanding that he was to return to have it filled as soon after the soreness ceased as convenient, but did not reappear for nearly two months; then stated that at the time of the extraction of the tooth he was actually suffering from insipient malignant typhoid fever, from which he had only just recovered. Does it not seem more than probable that the pain, experienced just at this time, in the pulp, which had doubtless been exposed for a number of months, was caused by the approaching fever? And does it not seem also more than possible, that any considerable amount of pain added to what the patient was already necessarily subjected, may have proven just so much more than he was able to live through. And is it not reasonable to suppose that, in view of the existence of many thousands of half dead or dying, capped pulps, and more thousands of fragments left in obscure canal-ends; left to rot and fester upon provocation, will, or do, so act at periods just as critical as those described in the cases under consideration.

But in order to reach the exact animus of this question, in short let us do a little ciphering. We will suppose that in the United States alone there are in round numbers twelve thousand practicing dentists. Then consider the minimum of cases likely to lead to serious periostitis and acute alveolar abscess, if not properly treated just at the proper time, as two, to the most skillful operator in the profession, while to the least skillful we may safely attribute the maximum as fourteen per annum. This would average seven such cases per annum, which would aggregate 48,000 patients, who, under the present system of pulp treatment and root-filling, are subjected to the more than possible tortures and quite possible dangers arising from alveolar abscess incident thereto. Add to these sixteen per cent. as the most unsuccessful cases of nerve-capping, which will lead to similar results, and we have in round numbers 100,000. This may be safely looked upon as the minimum of cases so treated annually.

A case interesting in this connection but resulting differently, was that of a young married lady who, some three years since, sent a request that I should visit her—as she was feeling too poorly to visit my office—for the purpose of treating a tooth, the roots of which I had filled ten years earlier, and which was now causing her great pain. Calling accordingly, I found her suffering intensely from inflammation of the parts, indicating unmistakably an approaching abscess, and as she expressed it, almost sick, which condition was attributed solely to the condition of the tooth. It required little skill, however, to discover that she was even then suffering from other causes, and that the then condition of the tooth was one of the results of that cause, all manifested by a generally depressed condition of the whole physical system. Believing it improper that, under the circumstances, she should be subjected to an hour's unnecessary suffering in addition to what seemed to be inevitably approaching from a cause, the nature of which was very certain, I immediately advised the removal of the tooth, and

that her physician should be called in, remarking that, much as I valued the tooth, yet the general health being of much greater importance, we must now turn our special attention to that. She replied, "I see you think I am going to be sick, I will be guided by your advice," upon which her husband immediately procured a carriage and took her to have it removed. Upon returning home after the operation she went immediately to her bed, to which she was confined during the longest and severest illness of her life, finally, however, recovering. It is true she might have done so, even with the additional suffering to which she would have been subjected had the tooth been retained.

But who can tell? Certainly, no one. Yet these cases point sharply to the great care that should be observed ere undertaking the treatment of an incipient tumor of this kind, which may cause many hours of most intense suffering, lest, adding this to the debilitating effects of some possibly approaching deadly malady, it be made the incidental if not primary cause of death. And do they not point as clearly to a possibility that the M. D., and the D. D. S., each duly deferring to the other's skill in his specialty, may frequently work together to much greater advantage than when either undertakes the duties of the other, or of both? And if so, it is no less true because in their united judgment they do not always correctly diagnose or succeed in warding off the more serious effects of a failure to comprehend the true nature of a lesion or its cause. And that this is not mere corollary, let us consider the testimony of the following cases and profit by their many suggestions.



About fifteen years since, a young but very intelligent physician brought for consultation a gentleman who had been suffering for about three years with an abscess of the inferior maxilla, which had during that period been discharging into a heavy beard from a fistulous opening immediately under the angle of the right side. Its history was stated substantially as follows: Three years prior to this time there had been filled with gold a large cavity in the

distal surface of the right inferior second molar, soon after which operation the contiguous muscles became painfully sore, while the tooth was apparently well and announced by the dentist as being in no way connected with the inflammation which however increased, finally resulting in the abscess described. Yet the tooth was pronounced innocent of the cause, and retained with the filling in position. The case finally passed into the hands of a physician, who believing that the dentist was correct, spent many months in fruitless efforts to cure. The patient then removing to Philadelphia, placed himself under the care of a physician here, who finally consulted a Philadelphia dentist of deservedly excellent reputation. He also pronounced the tooth free from any connection whatever with the tumor. After spending more time in unavailing treatment, the patient was brought to me for an opinion. Upon careful examination I unhesitatingly expressed a belief that the tooth was the sole cause of the trouble, and was asked by the physician what treatment I would advise, and replied, that as the tooth was dead, isolated, without an antagonist and positively useless, I would advise its immediate extraction. If otherwise, a removal of the filling and the treatment both through the foramen and the fistula. Whereupon the tooth was removed and in less than ten days the abscess was well, without further treatment, leaving no sign save the scar that it had ever existed. One of the many points of interest attached to this case is its refutation of the frequently expressed belief that no tooth can produce an abscess without becoming very sore, and generally very painful.

Another case very trifling in itself, but showing how much trouble may arise from failure to diagnose correctly, or to seek advice of a specialist to whom its treatment rightfully belongs, was that of a young servant girl brought to me by her mistress after a year's trouble from an abscess immediately under the mesial line of the chin. This patient had been for many months waiting on two eminent surgeons at one of our hospitals. They had already performed two

operations, the character of which I of course, know nothing but do know that if no better at her next visit, it was their announced intention to remove the inferior central incisors. At this juncture she was brought to me. It was only after very critical examination that there appeared any indication that their pulps were devitalized. The roots however were covered, for at least the upper third, with a black flinty tartar, which it was very difficult to dislodge. By the time its removal was accomplished, it seemed sufficiently evident that their vitality was extinct; whereupon the chambers were entered through the lingual sulce, the foetid gases expelled and the roots filled with gutta-percha after three days treatment; a week from which the abscess was entirely cured, leaving nothing but an unornamental cicatrix.

Perhaps the most singular case and its results of an acute alveolar abscess that I ever met with, was that of a young lady, who soon after marriage was brought to me to have her teeth put in perfect order, and in whose mouth was found a devitalized superior incisor. As the tooth was well filled on the approximal surfaces, I entered the pulp chamber through the palatal fissure. The tooth was but slightly discolored, and besides the devitalization seemed to be in an excellent condition, requiring no other treatment than that of purification, which I effected as thoroughly as practicable at one sitting, and temporarily filled with gutta-percha. After which she returned to her home in the country, and I heard nothing of her for a week or ten days. When she did report, it was to the effect that within a day or two after filling, the tooth had become very sore, suppuration took place, from which she had suffered great pain until it broke; after which the tooth remained so loose that it could easily have been extracted with the thumb and finger. I removed the filling, and believing that it would immediately recover, applied a simple dressing, (I think of glycerine,) painted the gums with iodine and requested her to call again in a few days. When she did so, it was found that instead of having improved it was much worse; in every

particular, and so loose as to seem likely to fall out, and for the next two weeks, to the best of my memory, would yield to no treatment. As it seemed to be a hopeless case, with ordinary modes of management, I determined, with consent of herself and husband to fathom the mystery by extraction. Upon doing so, the root was found covered to the thickness of the thirty-second of an inch, with a perfectly white fatty-like substance, much resembling minute skippers as though they had been cut in two and fastened by the cut ends to the periosteum and crowded so closely together as to leave no spaces whatever between them; and this condition existed from the extremity of the apex to within a line of the margin of the gum. Having really little hope of finally saving the tooth, I yet thought well to give it a trial, and therefore removed with a dull edged instrument all of the abnormal structure; finding the periosteum in a much better condition than could have been hoped for I thoroughly bathed the root with pure laudanum, served the socket in the same manner, returned the tooth to its place, tied it firmly in situ with floss silk, from which time the disease disappeared; a few months later I filled with gold, having found it sound and apparently firm as ever. It remained perfectly comfortable up to the day of her death, which occurred some two years afterwards of pulmonary consumption.

But it is possible that a devitalized pulp and filled roots may prove dangerous, even in the mouth of a perfectly healthy individual, as will appear from the following circumstance. In the winter of 1862, I think it was, a young college student of most robust health and constitution, came to me to have his teeth, which were in a very bad condition put in order. He had spent most of his vacation in holiday pastime among friends before going to the dentist, leaving but a few days in which to have accomplished work which should have been spread over as many weeks. All then must be done in a hurry; among the many operations needed was the removal of a nerve and filling the root of an

inferior bicuspid. The work was accomplished with every possible care and left no thought on my mind that the least trouble was to be apprehended, although everything was necessarily hurried through with the greatest rapidity; the young man immediately upon its completion, hastened to his home in New Jersey, I think, whence in a few days to return to college, but, alas! his college days were ended; from cold or other causes, the tooth became sore, an abscess suddenly formed, and the patient (if the account I afterwards received was correct), actually choked to death from swelling of the neck, the tooth having been allowed to remain in the mouth until very shortly before he breathed his last. A more minute account of the circumstances attending his death, I am unable to render, as what is here stated is all I ever received.

The question will instantly arise upon hearing this recital, as to how such catastrophe could occur if the pulp had been thoroughly removed, and the root perfectly filled. A number of possible conditions might be named, but that one probable in this case may perhaps be best illustrated by the following circumstance.

In the winter of 1856, while practicing in Pottsville, I attended to the teeth of a young man living four miles distant, for whom I removed the pulp and filled the roots of a very large inferior, first molar. The canals seemed to be unusually long, but sufficiently large in proportion, and easy of access to the accomplishment of all the work that seemed necessary with unusual ease, and when completed, I felt as unsuspecting of future trouble as though it had been the most simple operation possible. A few nights later, however, I was awakened by a furious ringing of the door bell. Upon opening the door, which I did myself, there stood my young friend W., for such was his name, having ridden on horseback through a cold driving storm the four miles that lay between his office and mine, with, as the poet hath written: "a raging canal in his mouth." How furiously raging you may suspect from the anxiety mani-

fested to rid himself of it by the four mile ride in the storm. It was of course, extracted as speedily as possible, but after such a tug as dentists rarely meet with; notwithstanding the length of the canal that had been filled, there lay beyond another division and lakelet, in shape like the leaf of the lemon trifolia; as long and as broad as a large grain of wheat flattened, thinner in the centre than laterally, between which and the former there was a contraction to almost nothing. This lakelet was filled with a highly inflamed and congested part of the nerve, which could not have been suspected, and therefore would not have been discovered by any operator.—*Dental Office and Laboratory.*

ARTICLE II.

PRINCIPLES AND METHODS OF FILLING TEETH WITH GOLD.

BY A. G. BENNETT, D. D. S., PHILADELPHIA, PA.

To the question, "What is the most urgent need of dentistry to-day?" several answers may be given. Perhaps few will dispute the assertion that our great need is scientific knowledge—exact and exhaustive—of the structures and materials, the pathology and therapeutics, involved in saving teeth. No one doubts that "the need of the profession of the age is to know;" but that "our mechanical ability has outrun our scientific attainments," may be considered a debatable question. To what extent have we been able to utilize our knowledge of dental anatomy and physiology in saving teeth? It is true that our most successful operators have usually been, and are, the best educated; yet skill, after all, is the one thing needful to give

any meaning or value to knowledge in practical dentistry. Dr. Thompson claims that "it is most imperative and important that we better understand *why* we perform our operations; the *how* will follow of itself. Filling a hole in a tooth is an absurdly simple thing to do—a mere mechanical and artistic performance." The *why* we fill a tooth has never been considered much of a mystery. The tooth cannot resist decay nor restore the lost portion—in short, it cannot fill itself. Again, what is the value of "scientific reasoning," as opposed to experimentation? Is it not a fact that all theories and supposed principles are established or destroyed by experimentation and experience? Again, Dr. T. claims that we are not scientific, because the lost parts are not restored in natural substance. There may be such a thing as "striving after the unattainable."

As long as the operation of filling a tooth is slightly surgical and largely mechanical, so long there will exist a greater necessity for developing skill than for acquiring knowledge. How many educated dentists are guided in operating by the structure and functions of the dental tissues? The enamel-rods, the living fibres, the nutritive currents, receive little or no attention, or must yield to mechanical requirements.

When all is summed up, it must be admitted that, though one *should* have the learning, he *must* have the skill. It has been not unfrequently more than hinted that some operators who can talk fluently and write elegantly on saving teeth are unable to make even a presentable filling.

Filling a hole in a tooth may be an absurdly simple thing as regards mechanical principles, especially if the tooth is to be thrown into the operator's drawer; and simple enough, even when the tooth is exposed to the forces and fluids in the mouth, if the object be merely to insert the filling so that it will be retained till it decays out; but to insert a gold filling in such a manner that the tooth will resist, for say ten years, all chemical, thermal, and perhaps electrical, forces to which it may be exposed, is quite a different thing.

Our text-books on operative dentistry, though treating the subject of filling in detail, give space and importance to certain features of the subject out of proportion to their relative value. For instance, Taft dwells at great length on the preparation of cavities by classes and their modifications, and on the various forms of gold; yet gives comparatively little exact information and few definite directions on the most essential of all points—the adapting or packing of the gold against the walls and around the margins of the cavity. No one doubts or denies the fact that proper preparation of the cavity is the basis of a perfect filling; but, after all, the adaptation of the gold to the dentine and enamel surfaces is the essential requirement. This is trite enough to those who use gold successfully, but it has not received the general recognition which its importance demands. Adaptation is the vital point, for the obvious reason that defects, even the smallest in the cavity, can readily be seen, with or without a magnifier; and removed, while defects in packing the gold are more or less concealed from view, and generally cannot be corrected except by taking out all or a part of the filling.

Some one remarks that it is difficult, if not impossible, to adapt two hard substances such as dentine and extra-cohesive gold to each other so as to form a moisture-proof joint; hence the necessity of having as much softness in the gold as is consistent with the required cohesion, and hence the necessity of an even, smooth wall; for, since adaptation to such a wall is difficult, it is obvious that it is well-nigh impossible to adapt gold against rough, uneven surfaces. It is clearly impossible to force gold into the minute inequalities of dentine and enamel. In short, as some one has said, a filling should resemble a cork in a bottle rather than a ground-glass stopper.

Though the essentials of successful tooth-filling are more or less familiar to all, yet, as a basis for what is to follow, they will bear repetition. "It has been said," remarks Dr. Atkinson, "that almost anybody can make a

filling moisture-tight. Almost nobody does. If the cavity is properly prepared, you will have no difficulty." The expert few may have no difficulty, but the unskilled many, even with a perfectly prepared cavity, will often fail of success.

To prevent breakage and leakage, and because a tooth is partly an animal tissue, and not wholly a mineral substance, the following are the essentials for cavity preparation :

1. A cavity should be so prepared and its border so beveled that when filled the tooth will offer the greatest resistance to mechanical and chemical forces.
2. Complex cavities should be so simplified and their parts made so accessible that the filling material can be readily and certainly adapted to their walls.
3. Approximate cavities, which extend to the excising edges or occluding surfaces of the teeth, should be so prepared and filled that the strength of the operation will be equally divided between the tooth and the filling.
4. The walls of a cavity should have no corners or acute angles, and should, when possible, form the segment of a circle ; and the bevel of the enamel should, as far as may be, conform to the line of its cleavage.
5. Smooth, strong walls, secure anchorage, and perfect adaptation of the filling material to the tooth-bone, are the essentials of durability.
6. As regards the enamel, it is better to remove too much than too little ; as respects the dentine, better to remove too little than too much ; and as to the anchorage, it had better be too deep than too shallow.
7. Anchorage should be secured by so combining pits and grooves as to do the least injury to the dentine and give the greatest strength to the filling ; and the enamel should, when possible, be supported by living dentine.

And, to sum up, smoothness of surface and softness of material insure closeness of adaptation.

A few words on the final preparation of approximal

cavities may not be amiss. Dr. Jack's idea that a grove-cutter should have a rounded edge, is certainly a good one. A concave floor to the groove gives greatest strength, besides being exactly adapted to a convex surface on the plugger. After grooving, take a sharp spoon excavator of the proper size, and remove the fine edge from the margin of the groove. With a chisel excavator cut and scrape the cervical wall till all softness of the dentine and roughness and whitish appearance of the enamel have been removed; then polish all accessible surfaces.

Much as opinions and theories may differ in regard to the various forms and methods of using gold, all successful operators are agreed that softness of the metal is the essential property for tooth-preservation. The value of the cohesive property, essential as it is for contour work and in restoring crowns, has been over-estimated, and to many it has proved a delusion and a snare, because of easy welding and difficult adaptation. Who has not observed and admired the beautiful working of this gold? Yet how few have noted the fact that its adaptation could scarcely be worse. To many for years the cohesive property contained the "promise and the potency" of all that is "ideal" in the perfect filling material. For those who claimed that if a tooth was worth filling at all it could be filled with gold, and then proceeded to fill all cavities without regard to the quality of the tooth-bone with cohesive gold, there could be nothing but ignoble failure. Some few expert manipulators of cohesive gold have attained phenomenal success; but of some of these one can truly say: "they did not live to see their wrecks," their careers being cut short by too intense devotion to their golden idol.

If there was nothing more difficult in operative dentistry than the welding of cohesive foil, even when one end of the mass is anchored in a carious cavity, the record of failures would form a small part of dental literature. Those who have regarded the cohesive property as something of a marvelous mystery, seem to have lost sight of the two

facts that cohesion is an inherent property of all metals, and that gold when pure and clean welds cold simply because it does not oxidize. Had the value of softness in cohesive gold been noted and understood sooner, there would be less reason to be lost in wonder that teeth decay so readily and so rapidly around gold which worked so beautifully. True, cohesive gold is relatively soft and ductile, and when used in the form of ribbons, even though made from heavy foil, some operators have no doubt been able to "swage" and "strap" and "band" it beneath and over and around the frail enamel walls of even delicate laterals; but the inherent ability and acquired skill to do these things have been given to the favored few.

The best gold is not always "that which can be worked the most easily, rapidly and perfectly," but that which can most safely and certainly be adapted to dentine and enamel walls. Extra-cohesive gold may not work the most easily, but it certainly works the most rapidly, as large pieces and many thicknesses can be used under a broad plugger; and it works perfectly, since it makes a mass which is securely welded; yet the adaptation may be most defective.

Not many will dispute the assertion that few gold fillings are absolutely perfect. Most of them have two kinds of defects—visible and invisible; the former of course being around its margins in the enamel or gold, and the latter at any point over the entire surface of the cavity. As the condition of the cavity can be readily seen and the kind and form of gold selected, the causes of these defects can be narrowed down to the instrument and its proper or improper management.

1. It may be laid down as an axiom that pluggers should be so constructed and gold used in such a manner as to exclude, with the minimum of time and attention, all defects which from their nature cannot be detected by the eye.

2. Not only the shape of the tooth, but mechanical requirements, as well as esthetic considerations, demand

that the walls of a cavity should generally form the segment of a circle. And if their form be not a matter of mere fancy, the size and shape of end and curve of shank in filling instruments must be determined by and adapted to the size and shape and position of the cavity.

3. Owing to the position and condition of cavities and teeth, gold is adapted to dentine and enamel surfaces *directly or indirectly*. When the walls are strong enough it should be adapted directly, and when the walls are weak or the tooth frail it must be adapted indirectly—or, in other words, spread or wedged against the walls. This determines that there are essentially two kinds of pluggers—one for direct, the other for indirect, adaptation.

4. The cavity walls, especially the cervical, being concave, requires that the face of a "direct" plugger should be convex, to secure perfect adaptation; and this form of face, besides, will insure thorough condensation and welding more certainly than a flat surface, because of the difficulty of holding two flat surfaces squarely against each other.

5. Experiments prove that gold will spread only under a convex surface, either smooth or serrated transversely, the instrument when serrated being so held that the cuts or valleys are at right angles to the cavity wall. Pits and grooves, as well as small cavities and fissures, admit only of indirect adaptation; hence "indirect" pluggers for these should always have a convex face, serrated in one direction only, so as to spread the gold slightly but firmly against the walls. "Direct" pluggers, when used within the cavity, may be serrated one or both ways; but when used beyond the wall they should be serrated in both directions, for the reason that here spreading of gold would be a detriment rather than an advantage.

6. "Direct" pluggers are generally of the foot shape, and consist of two kinds—one short and relatively thick, and the other long and thin; the short being used within the cavity and beyond its walls, as in restorations, and the long being intended to complete the filling where space is

limited, as between the front teeth. The end of an "indirect" plugger is usually small, and may be round, oval or flat.

7. In regard to serrations, it may be observed that they answer two objects, viz.: prevent slipping, and leave a rough surface. Smooth points, though they spread the gold, have been tried and found wanting, because by slipping slightly they burnish the gold, thereby damaging, if not destroying, the cohesive property.

8. Smooth convex points, besides spreading the gold, prevent pitting and porosity. Small points serrated both ways effectually prevent spreading, besides tearing and cutting up the gold; but convex surfaces cut one way combine the good qualities of both kinds without the defects of either. When soft gold is packed like tin, of course the serrations must be deep, and the plugger should be cut both ways, so as to secure sharp points to interlace the metal; but when the cohesive property is utilized, no one will now claim that the serrations are intended to cut through and interlock the gold.

9. The pitting or porosity caused by serrations is reduced to the minimum by having the pluggers cut fine. As pluggers of the foot shape are seldom available for indirect adaptation, and because of their relatively large surface do not cut up the gold, they should always be serrated in both directions; but no good reason can be given why a small "indirect" plugger should be cut both ways.

The writer has devised a set of pluggers based on the foregoing principles and theories, which he has endeavored to verify. These points are the result of a number of experiments undertaken with the view of determining the best form of face and kind of serrations for making a moisture-proof joint with the least risk of injury to the tooth-bone. These points are so shaped and serrated that some, if not all, of the common and usually invisible defects can be excluded with a good degree of ease and certainty, and that, too, without unduly taxing the time and attention of the operator.

This set of pluggers consist of modified and original forms. There are five ordinary round and one flat point, and six foot-pluggers, three short and three long; and it is believed that these, in connection with the most useful hand-pressure points, will enable the operator to reach every cavity that can be entirely or partly filled by mallet force. This set of instruments was illustrated in the *Dental Cosmos* for October, 1885.

A few words on the automatic mallet, for which these points are intended, may not be amiss. The blow of the Snow & Lewis automatic mallet, which is justly regarded as the best, is a little too sharp and painful for the safety of the enamel and comfort of the patient. These defects are easily removed. It has been the habit of the writer for some years to put a drop or two of castor-oil on the end of the mallet, which is done by taking it out of the case. The blow is modified partly by some of the oil remaining on the upper end of the plugger-socket, and partly by some of it gradually working in around between the mallet and the case, thereby retarding the descent of the former and increasing its effectiveness; for the blow seems to combine all the good qualities of steel and lead without their objectionable features. Besides this, the working parts of the mallet should be occasionally lubricated with engine-oil. Owing to the strength and temper of the spring, all mallets cannot be equally modified by the method just described. To save time and avoid changing points, the operator should have two or three automatic mallets, or it should be used in combination with the hand-mallet.

In concluding, the writer would say that, though these points may not be perfect as made, it is believed that it can be demonstrated that they embody the correct principles.—*Dental Cosmos*.

ARTICLE III.

DIAGNOSIS—ITS IMPORTANCE.

Early in our professional career we often met in council an aged physician who was very highly educated, and whose counsel, as to the treatment of disease, was highly prized, yet it is probable that, in his own practice, he often, if not generally, failed to know what ailed his patients. Perhaps his powers of observation were naturally defective, but let this be as it was, when the pathological condition of your patient was pointed out to him he would give to you good, sensible advice as to treatment. Noticing this physician's misfortune, awakened us to the great importance of correct diagnosis.

Some physicians, or so-called ones, however, succeed in gaining the confidence of communities, and in amassing wealth, without much information in diagnosis or in anything else. One that we knew made reputation by calling every little excrescence a cancer, and burning it out with crude potash prepared by himself, accompanying the process of preparation with some mystic flourishes, such as breathing on the material nine times while his eyes were closed. It was claimed in his behalf that this enabled him to discriminate so as to avoid sound underlying tissue, and thus "eat" only the cancer. A wart, a wen, a whitlow, or whatnot, was a cancer in his vocabulary, and, that his medicine would eat it was holy-writ proof that his diagnosis was correct.

In like manner, we see, almost daily, a quack who calls any cough consumption, increased action of the kidneys, due to cooler weather, is Bright's disease, a common itch is scrofula, and eczema is leprosy; and, as the fool-killer has long been derelict in duty, he prospers financially.

By mistaking or mis-stating the diagnosis, a man often gets credit for marvelous, and almost miraculous cures,

Dentists don't treat such great varieties in disease as do physicians; but they too have their difficulties and make mistakes. The disease known as *pyorrhæa alveolaris* illustrates this truth. A patient's mouth may be very offensive, his gums may be red, spongy and swollen, crusts of salivary calculus may abound, and the dentist may call the trouble by the long latin name above, scrape off the tartar, apply a lotion, suggest a tooth-brush, and report the case cured by a single application. Are not such cases common? Does the description refer to a familiar or to an unfamiliar scene? But all named in the case above may be present, and all claimed may occur, and yet no *pyorrhæa alveolaris* has been cured, nor has it been even treated.

A genuine case of the virulent disease may present milder symptoms than are described above; yet the man who professes to cure genuine *pyorrhæa alveolaris* in a day, and by a single application, may be a good manipulative dentist, and an honest, sincere man, but we always take for granted that he has made a mistake in diagnosis. The man who really understands the pathology of this disease will not regard it as purely local, and he will not rely wholly on scraping, or other local measure.

In treating pyorrhœa it is quite important to remove all deleterious and unpleasant accumulations from the teeth, and even from the entire mouth. Cleanliness is akin to godliness; and it is as important here as in the treatment of typhoid fever. No sane physician would allow excrementitious matter to remain in the bedroom of the invalid in such case, but he would not claim to have cured the patient by its removal. And were the typhoid patient to regain his health within a day after a single removal, we would all know the physician had erred in diagnosis when he called it typhoid fever.

An eccentric physician claimed that he was making a good average in his practice, as he cured a goodly number who were getting well anyway, and killed some who would have died even without treatment. It may be that some of

our specialty have had similar experience, even when endeavoring to do the best for his patients.

But if in writing this we succeed in calling the attention of our readers to the importance of correct diagnosis, thereby inducing some to greater carefulness and closer study, we shall be well repaid for the brief effort. In referring to the cases of extreme disregard in this direction it is not our purpose to intimate that we know of dentists deserving to be classed with such; but in setting forth extremes, we can better show the exceeding blackness that is possible when developed by the united forces of ignorance and dishonesty. —*Ohio State Journal of Dental Science.*

ARTICLE IV.

NEW REMEDIES.

BY C. J. BOYD WALLIS, L. D. S., ENG., &C.

Mr. T. Christy, F. L. S., of the enterprising firm of Christy & Co., Drug Importers, Fenchurch Street, and author of "New Commercial Plants and Drugs," and others of the drug trade, are continually introducing new medicinal drugs and chemicals to the notice of the profession, and it is well for us to take note of them, that we may glean from them those of special value as additions to our Dental *Materia Medica*, for some of these new remedies might be employed with advantage to a much greater extent than they are in dental surgery.

ACETATE OF ALUMINIUM is a valuable antiseptic and deodorant, that has been too much over-looked by the medical and dental professions, and this neglect is greatly due to the difficulty of preparing, at a low price, a perfectly neutral solution, and also to the fact that its value as a

deodorizer of blood, used in the purification of sugar, was long kept a secret in the interests of sugar refiners. The value of the acetate for purposes of embalming was made known by Gammal in 1827; Burow, in 1857, called attention to its value for destroying the disagreeable odor of gangrenous wounds, and Professor Bruns confirms the statement, while Professor Bilbroth asserts its value as an antiseptic to be equal to that of carbolic acid. Dr. Brun states that during the twenty years in which he had treated wounds with the acetate, he had not seen a single death from pyæmia, even under the most disadvantageous conditions. Dr. A. Rose, of New York, strongly recommends it as an antiseptic and deodorant, and gives the following method of preparing it for medical purposes:—Ten parts of sulphate of aluminium are dissolved in the least possible quantity of hot water, and 17 parts of crystallized acetate of lead are added, also dissolved in hot water. The two solutions are then mixed. The sulphate of lead is allowed to settle, and the decanted supernatant liquid is treated with hydrogen sulphide, and after filtration, to remove the lead, it is warmed until the odor of the gas is driven off. The liquid is then diluted until it measures 48 parts. One ounce of the liquid should then contain a drachm of anhydrous acetate of aluminium. Thus prepared, it has a specific gravity of 1.0392. It can be obtained in the form of scales, soluble in water, in the same way as other scaled preparations.

Dr. Wilson, of Aix-la-Chapelle, employs acetate of aluminium in solution as a mouth wash during the administration of mercury in syphilitic diseases, and states that by its use salivation is prevented. He uses the following formula:

Acetate of Lead.....	340 gra.
Powdered Alum.....	330 "
Distilled Water.....	16 oza.
Aromatic or Peppermint Water.....	8 "

Dissolve the lead and alum salts separately in the water; mix and stir well together; either filter or allow the

precipitate to settle, and decant the clear solution, to which add the aromatic or peppermint water. It may be used in a more diluted form if necessary, and the mouth should be regularly rinsed out from the beginning of the treatment to the end a dozen times a day, or even more, and in urgent cases during the night; if by any means salivation should occur, its ill effects are counterbalanced by the use of the aluminium wash. A 2 per cent. solution is said to be sufficient to permanently protect organic substances from putrefaction, and for purposes of irrigation a 1 or $\frac{1}{2}$ per cent. solution may be used.

I have prescribed the following formulæ, which I have found to be a most excellent mouth wash, and at the same time a useful preservative of anatomical specimens and other organic substances:—

Acetate of Aluminium.....	82 grs.
Boric Acid.....	64 "
Glycerine, pure.....	1 oz.
Oil of Eucalyptol.....	10 m
Engenol.....	6 "
Eau de Cologne.....	1 oz.
Chloroform Water.....	to 6 "

Mix. This may be used as it is or diluted, as required.

The next preparation to notice is IODOFORM: tri-iodomethane, C H I_3 .—This is not, strictly speaking, a new preparation, but a new process has been introduced by which an absolute iodoform—that is an absolutely pure product—is obtained by means of electrolysis. A sample has been supplied to me by Messrs. Zimmermann, agents in London for the manufacturers, Schering & Co., of Berlin. I regret that I have been unable to ascertain the exact method of the electrolytic process employed in its production. It is possibly a trade secret. But it is probably obtained by precipitation, by passing a constant current of electricity through a watery-alcoholic solution of iodide of potassium to which a uniform supply of carbonic acid is admitted; at any rate, chloroform, iodoform, and bromoform may be obtained by passing an electric current through

a hot strong alcoholic solution of chloride, iodide, or bromide of potassium respectively, carbonic anhydride being simultaneously supplied.

In reference to the deodorization of iodoform, so many things have been suggested for this purpose—notably, otto of rose, sanitas oil, tannic acid, Tonquin bean, balsam of Peru, and carbolic acid—but all of these are more or less failures; the most successful in my hands being carbolic acid, yet even this takes some few weeks to act before deodorization is complete. Dr. Putz, of Graefrath, says that he confines himself to oil of mirbane or nitrobenzol for this purpose, all other deodorants having failed in his hands. He uses six drops of nitrobenzol for every gramme of iodoform.

Coffee, a more perfect deodorizer than any of the foregoing, has been suggested by Dr. Oppler, and he has found that from 20 to 50 per cent. effectual for this purpose. It is said that coffee, when roasted, is an excellent application for wounds, and the effect is attributed to the presence of vegetable charcoal and to the aromatic empyreumatic compounds formed during the roasting process. A compound of 50 parts of iodoform and 25 parts of finely powdered coffee, triturated with a few drops of ether and then dried, will be found effective. A useful external application may be made by combining

Iodoform.....	1.00 grms.
Paraffin	10.00 "
Powdered Roasted Coffee.....	0.80 "

Mix.

The taste of castor oil may be disguised by combining

Castor Oil.....	8 parts.
Powdered Roasted Coffee.....	1 "
Powdered Sugar.....	to taste.

Mix.

Other drugs of an unpleasant taste or odor may be combined in a similar manner.

IODOL: Tetraiodpyrrol, C_4I_4NH .—Another antiseptic has been more recently introduced and favorably reported

upon by Dr. Mazzoni, of Rome; it is, I think, a preparation which we shall find of the greatest value in the practice of our specialty, for it has this great advantage over iodoform, that it is free from the unpleasant and penetrating odor of the latter, and it does not produce any symptoms of intoxication, while it contains about 90 per cent. of iodine, only 7 less than iodoform.

Iodol is a tetraiodpyrrol. Pyrrol is one of the constituents of animal oil, the distillate obtained by subjecting animal substances containing protein bodies to destructive distillation. When this is freed from impurities and then precipitated by iodide of potassium, an iodine substitution product is obtained, namely, tetra-iodpyrrol, and this product has been called *Iodol*, for brevity's sake, by the discoverers, Drs. Silber and Ciamician, of Rome. Messrs. Kalle & Co., of Biebrich on the Rhine, are now manufacturing it on a large scale, and I suspect it will soon be as readily obtained through the usual channels as iodoform.

Iodol forms a light brownish micro-crystalline powder, free from taste, having a faint odor resembling thymol, and upon heating to a temperature of 100° C. iodine vapor is evolved. It is almost insoluble in water, moderately soluble in hot oil, freely soluble in ether, chloroform, and in three parts of alcohol; more soluble in absolute alcohol. It is not precipitated from an alcoholic solution by the addition of glycerine, but it is by the addition of water. Sulphuric acid dissolves it with a green color, and nitric acid changes a heated alcoholic solution to a bright red. It possesses antiseptic properties similar to iodoform, exercises a local anæsthetic action, and greatly promotes the granulation of wounds.

NAPHTHOL.—*b*-Naphthol: Syn. naphthol alcohol. Naphthol is another important product; but it has been but little used in the dental surgery up to the present time, yet it is, I consider, second to neither of the foregoing in its value as a therapeutic agent in the treatment of the teeth. This preparation I have now employed for a considerable

time, and I have found it invaluable as an antiseptic, disinfectant, and deodorant. It is especially as the latter that I have used it, and with the best results.

The preparation I employ is a pure re-sublimed *b*-naphthol. It is a derivative of coal-tar, and is in white shining laminar crystals, having an odor similar to storax. It has a sharp burning taste, and its powder excites violent sneezing. It is very soluble in ether, chloroform, and benzol; slightly soluble in hot water; soluble in an equal weight of alcohol, and in 1 part in 8 of olive oil and lard, and in 1 part in 80 of vaseline. It sublimes on heating, and may be distilled with steam, a property to be remembered when making hot solutions, or loss will occur.

Naphthols are compounds derived from naphthalin by the substitution of one molecule of hydroxyl (H. O.) in place of one of hydrogen. There are two naphthols, *a* and *b* (alpha and beta) naphthol, so named for the purposes of distinction. They are respectively formed by fusing the two acids, alpha-naphthalin-sulphonic acid and beta-naphthalin-sulphonic acid, with alkalies, whereby hydroxyl is substituted for the sulphonic acid (H. S. O₃), *a*-naphthol is with difficulty soluble in hot water; easily soluble in alcohol and ether. *B*-naphthol, owing to the greater stability of the *b*-naphthalin-sulphonic acid, is more easily prepared, and it is this product that is generally sold in trade as naphthol. When pure, it is white, melts at 122° C., boils at 286° C., and on the addition of ferric-chloride its solution is changed to a greenish color, while *white* di-naphthol is separated; and with the addition of ferric-chloride to an aqueous solution of *a*-naphthol, *violet* flakes of di-naphthol are thrown down.

Naphthol being odorless and colorless, gives it some advantages in the treatment of skin diseases, for which it has been successfully employed in advanced scabies, eczema, psoriasis, and for hyperidrosis, chronic ulcerations in ano, urinary fistula, abscesses, necrosis, &c., it has also been used to disinfect rooms, for which it is excellent and specially

suited, as it destroys all offensive odors, and not, I think, as some so-called disinfectants do, by overcoming a lesser odor with their stronger odor, but by chemical action: and for this purpose it may be sublimed by means of a spirit lamp placed beneath a dish containing the naphthol; the crystals of naphthol in minute subdivision are thus driven off by the heat, and penetrate every portion of the room, which becomes perfectly deodorized. If applied in solution (15 to 20 grains to a pint,) it encourages healthy granulations in wounds, and stimulates the growth of new tissue.

The following compound is similar, but of a somewhat milder form, to that which I communicated to the *Lancet* some months ago. It is an invaluable, agreeable and refreshing application for foetid odors of the feet and body arising from excessive perspiration, wounds, &c.

The formulæ is as follows:—

Naphthol resublimed.....	5 parts.
Salicylic acid.....	5 "
Boric acid.....	10 "
French chalk, pure.....	80 "
Engenol.....	5 "

Mix. Perfume if desired.

A useful formulæ for an external application for eczema, hyperidrosis of the hands, feet, &c., may be composed as follows:—

Naphthol resublimed.....	5 parts.
Glycerine, pure.....	11 "
Engenol.....	4 "
Alcohol.....	80 "

Mix.

This brings me to a compound which I have long used in the treatment of the teeth, and for the formula of which I have frequently been asked. It is as follows:—

Naphthol resublimed.....	8 drachms.
Iodol.....	1 "
Menthol.....	3 "
Carbolic acid, pure.....	4 "
Engenol and Eucalyptol aa.....	9 "
Chloroform, 6 drachms; absolute alcohol, ad. 8 ounces. Mix.	

For a permanent dressing for nerve canals I employ a similar preparation of a stronger character, made by the addition of another dram each of iodol and naphthol and two drams of gum sandarach.

This preparation, using until lately iodoform instead of iodol, I have found of the utmost value. It is at once a powerful antiseptic, disinfectant, and deodorizer, and an excellent application for a painful tooth. ¹Space will not permit me to enter into an account of the experiments I have made with naphthol preparations upon teeth in the mouth and out of it; but I may mention that I have filled nerve canals of extracted teeth with this preparation, and filled over it in the usual manner, and placed these teeth in various solutions and in human saliva for various periods of from three months to two years, and have then broken these teeth open at the end of the respective periods, and have found the dressing in every case perfectly sweet. I am of opinion that we have in naphthol the most durable and permanent antiseptic of all other preparations for the treatment of the teeth with which I am acquainted, with, perhaps, the one exception of cupric oxide, for it is not decomposed or rendered inert by contact with organic matter or the products of putrefaction.

HYDRONAPHTHOL.—In English and foreign journals attention has been recently called to this preparation which, it is said, occurs in commerce as a grey powder of a micaceous appearance, having a faint odor resembling naphthaline. Dr. Fowler recommends it very strongly as an antiseptic; it is sparingly soluble in water, but dissolves freely in alcohol, ether, chloroform, and fixed oils. It has been described as belonging to the aromatic series, and bearing the same relation to the hypothetical radical naphthyl as carbolic acid does to phenyl. A saturated aqueous solution (viz., 1 in 1,000) is stated to be perfect in its inhibitory action, and to preserve animal tissues and liquids perfectly for an indefinite period, although producing no other perceptible effect upon living tissue than coating it with a slight film. It is said to be non-poisonous, non-irritant, and non-corrosive; having an antiseptic

power second only to mercuric chloride, and ten times greater than carbolic acid. It fuses between 113° and 118° C., gives off vapor at 126° C., commences to sublime at 130° C., and sublimes all but a dark carbonaceous residue between 140° and 145° C., the sublimate forming small, colorless rhombic plates. A powder composed of two per cent. of hydronaphthol with carbonate of magnesium or silicious earth is stated to have advantages over iodoform. It has been said that hydronaphthol corresponds with impure δ -naphthol. I have not tested the value of hydronaphthol, but if these assertions are correct they bear out my statements in reference to the value of δ -naphthol. —*London Dental Record*.

ARTICLE V.

COCAINE IN TOOTH EXTRACTION.

BY THE EDITOR OF *London Dental Record*.

The remarkable properties of the alkaloid, Cocaine, have, practically, been brought prominently before the medical world only within the past eighteen months. The readers of the *Dental Record* have been kept *au courant* of the chief features of the literature on the subject. During the last year it was very exceptional not to find in every medical periodical some mention made of the drug, and the pages of this journal have contained numerous articles and selections. In that manner has there been presented a sketch of the botany of the coca plant; a history of the medicinal properties of its leaves; an account of the introduction of the alkaloid, cocaine, as a local anæsthetic; of the physiological action of the drug, as far as has been made out, together with certain preparations and formulæ. In the July number (vol. v., p. 323), mention was first made of the hypodermic injection of a solution of cocaine for the

painless extraction of teeth, painting the gum with it having been found to give but little relief.

Since then Mr. W. A. Hunt, L. R. C. P., &c. communicated to the January number of the *Journal of the British Dental Association* the successful results of his experience. He describes his *modus operandi* as follows: My hypodermic syringe has a capacity of nine minims, and is furnished with a steel needle; it is easily kept sharp with an oilstone, and is better than gold, which too easily becomes blunt. The syringe being filled with hot water, its contents are squirted into a small, short test-tube, at the bottom of which one grain of hydrochlorate of cocaine has been placed. If the salt shows no disposition to dissolve, you can heat the test-tube gently over the spirit lamp until the solution is perfectly clear; then dip in your syringe and take up four minims. Puncture the gum first on the buccal aspect about the centre of the tooth you propose to extract, pressing the needle as vertically as you can, so that its point may reach nearly as far as the apex of the root. The pain of the puncture is usually very slight, and is hardly regarded as the needle passes onward. If the sloping surface of the point is turned towards the alveolus, there is less chance of the bone arresting the onward progress of the needle, and this is the chief difficulty in injecting. Having thrust the needle as far as needed, press the piston; often it will not yield even with force, but if you wait patiently, keeping up firm pressure and perhaps rotating the needle, or even withdrawing it a little, the solution will assuredly flow into the tissues. Keep the needle there half a minute, to prevent the possibility of any of the solution escaping by the puncture. Then re-charge your syringe with the four or five minims of the solution still remaining in the test-tube, and in a similar manner inject deeply the tissues on the lingual side of the tooth. It is remarkable how, when your patient is at the moment suffering from tooth-ache, entire freedom from pain occurs in five or ten seconds after even the first injection.

You have now quickly and deeply injected a strong, hot solution of the agent; the conditions for rapid absorption are thus excellent, and in two minutes, or even less, you can operate with forceps, elevator or splitting forceps, as may be required.

I have never injected less than a grain, but where the solution has flowed out through the puncture, of course there has been a waste of power.

As solutions of this agent do not keep, I have never used anything but a solution I have prepared myself immediately before the operation, as above described. If you cannot depend upon the accuracy of your chemist, use delicate scales and weigh the cocaine yourself. The grains may be folded in small papers separately, and put in a small stoppered bottle, so that no time may be wasted. I mention accuracy, as, if you take the trouble to weigh reputed grains, you will be astonished what different quantities they sometimes represent.

That the question of using a freshly prepared solution is not a fanciful one, is shown by the discussion at the late meeting of the Ophthalmological Society, where evidence was brought forward by more than one member to prove the occurrence of irritation and inflammation after using solutions which had been kept for some time.

Now, with hypodermic injections, this is a danger that must never be lost sight of, and there is good reason for my bringing it forward. Likewise the syringe must be kept scrupulously clean, for it has often to be passed through tissues filled with the products of inflammation; so after use it should be very carefully wiped clean, and I then draw a few drops of liquid carbolic acid up and down the needle, and then wipe it dry.

My opinion is, that where there is much infiltration (by the products of inflammation) in the tissues, a slightly larger dose than a grain may be given, and a minute or so more granted for time for absorption. . . . I have not observed as yet any constitutional symptoms follow this

method, nor have I as yet found the injection to cause any local irritation.

Dr. D. W. Barker, writing in the *Independent Practitioner*, "On The Use of Cocaine by Hypodermic Injection for Extraction of Teeth," says—Complete insensibility to the pain of extraction may be produced by injecting, with an ordinary hypodermic syringe, five drops of a four per cent. solution under the gum, directly over the root of the tooth to be extracted. It will take from five to eight or nine minutes to get the full anæsthetic effect of the Cocaine. Pricking the gum to test its insensibility will indicate when to extract. The extent of insensibility is limited to a small space around the place of injection, and the effect lasts from ten to fifteen minutes, and then passes away.

An important fact to be kept in mind is that the agent is injected directly into the circulation of the patient; hence the drug and its solution should be the purest possible, and the instrument absolutely clean. In order that the solution may be of the best, it should be made of distilled water; all ordinary water contains some organic matter, and a solution made of it will sour in about a week and become not only unfit for use but positively dangerous.

In making the injection care must be taken to inject no air into the tissues; this may be avoided by drawing some of the solution into the syringe, then turning the point upward and expelling the liquid; any air in the syringe will go out first; then fill the syringe as full as required. To avoid running the point against the edge of the alveolus, and also to avoid the thick and somewhat tough margin of the gum, let the point enter the gum an eighth of an inch from the margin, and, following the surface of the bone, pass in at least three-eighths of an inch; if the bevelled side of the point is held next to the bone it will avoid sticking against it. Press on the piston rod gently and slowly, so as to expell the liquid a drop at a time; inject half of the five drops on one side (buccal or labial) of the tooth, and remaining half on the other (palatine or lingual) side; hold

the syringe point still for half a minute, and then withdraw it slowly, so that the liquid may be taken up by the tissues, and not spurt back when the point is withdrawn. For molars, injection may best be made horizontally, instead of vertically. If there are two or three roots standing close together the injection should be midway between them.

I have been asked if the injection itself does not cause pain. If the gum is first bathed with the solution and the syringe needle is kept very sharp, there need be little cause for complaint. The wound always heals kindly and quickly and there is never any swelling or pain, or any sign of local inflammation or systemic disturbance; the place where the injection is made causes no trouble, but heals with the rest of the wound, and all sign of it disappears.

My own experience fully bears out that of Mr. Hunt, and of Dr Barker. There is always a certain amount of the solution lost into the mouth in the act of injecting, so that of ten minims, having a grain of the alkaloid in solution, probably not more than two-thirds are injected into the tissues of the gum. In one case I took a grain and a half of cocaine, and added fifteen minims of water. A few drops were allowed to flow upon the gum of the upper jaw around the margins of the roots to be removed. After waiting about a minute, the needle was inserted along the buccal side of the first bicuspid, the point going to nearly on a level with the apex of the root, with scarcely any pain, forcing five minims out of the syringe, some of which entered an abscess sac. A similar quantity was injected into lingual gum, between second bicuspid and first molar, and the remaining five minims on the buccal aspect of gum, between first and second molars. After waiting about two minutes for absorption and the effects of the cocaine, I removed the roots of first and second bicuspids; the three roots of first molar; attempted the extraction of second molar, first with root forceps, then with ordinary molar forceps, and again with root forceps, bringing away the two

buccal roots together, and afterwards the palatine root. All this was done leisurely; the patient rinsed the mouth with water on three occasions, and yet the whole operation was, according to the girl's evidence and, appearances, without pain. There being an immense abscess over the roots of the bicuspid, there was set free such a large quantity of blood and pus as to completely mask the roots behind. This was got rid of by washing the mouth as just mentioned, facilitating the remainder of the operation without marring the local anæsthesia. It is quite beyond possibility that I could have done so much with one administration of gas, or even gas and ether, and a second administration was, from the nature of the case, out of the question.

Cocaine hypodermically injected, as here set forth, is an immense boon to both patient and practitioner; to the latter especially, for ample time is given, which is not the case when nitrous oxide gas is administered, for the extraction of broken down and difficult teeth; at the same time, the patient, being conscious, can help in the work. The maximum anæsthetic effects are said to be observed between five and eight minutes after injection; the anæsthesia to last from ten to fifteen minutes, and then gradually disappear.

Until more is known of the constitutional effects of cocaine, it would be wiser not to indiscriminately inject several grains into one individual during the same day. It would appear that the alkaloid, when given to a certain extent, stimulates the sympathetic, increasing the heart's action and the blood pressure, with dilatation of the pupils. Among its toxic effects there have been noted sensations of coldness, paleness of the body, giddiness, uncertain gait, and a condition resembling alcoholic intoxication.—*Dental Record*.

ARTICLE VI.

FOOD-ACCESSORIES; THEIR INFLUENCE ON
DIGESTION.

The results of experimental inquiries on the subject of foods and food-digestion, when scientifically conducted, cannot help being of great practical importance to man, so intimately is his perfection and intellectual activity dependent upon his ailmentation. Among the results of certain experiments on this subject by Sir W. Roberts, as given in the *Nineteenth Century*, the following will be found of interest.

Man, as the author says, is a very complex feeder; he has departed, in the course of his civilization, very widely from the monotonous uniformity of diet observed in animals in the wild state. Not only does he differ from other animals in cooking his food, but he adds to his food a greater or less number of condiments for the purpose of increasing its flavor and attractiveness; but, above and beyond this, the complexity of his food-habits is greatly increased by the custom of partaking, in considerable quantity, of certain stimulants and restoratives, such as tea, coffee, cocoa, and the various alcoholic beverages, which have become essential to his social comfort, if not his physical well-being.

But the generalized food-customs of mankind are not to be viewed as random practices adopted to please palate or gratify our idle or vicious appetite. These customs must be regarded as the outcome of profound instincts, which correspond to important wants of the human economy. They are the fruit of colossal experience, accumulated through successive generations. They have the same weight and significance as other kindred facts of natural history, and are fitted to yield to observation and study lessons of the highest scientific and practical value.

First, with respect to the action of ardent spirits on di-

gestion, experiments were made with "proof spirit," and with brandy, Scotch whiskey and gin; and the conclusion is, that, so far as salivary digestion is concerned, these spirits, when used in moderation and well diluted, as they usually are when employed dietetically, rather promote than retard this part of the digestive process; and this they do by causing an increased flow of saliva. The proportion must not, however, much exceed five percent; and gin seems to be less injurious than brandy or whiskey. It was noticed in these experiments that both of these interfered with the digestive process, precipitating the starch more readily, altogether out of proportion to the amount of alcohol they contained, and brandy was worse than whiskey; and this circumstance appears to be due to certain ethers and volatile oils in them; and brandy contains a trace of tannin, which has an intensely retarding influence on salivary digestion. Even very small quantities of the stronger or lighter wines—sherry, hock, claret and port—exercise a powerful retarding influence on salivary digestion. This is due to the acid—not the alcohol—they contain, and if this acid be neutralized, as it often is in practice, by mixing with the wine some effervescent alkaline water, the disturbing effect on salivary digestion is removed.

In the case of vinegar, it was found that 1 part in 5,000 sensibly retarded this process, proportion of 1 in 1,000 rendered it very slow, and of 1 in 500 arrested it completely; so that, when acid salads are taken with bread, the effect of the acid is to prevent any salivary digestion of the latter—a matter of little moment to a person with vigorous digestion but to a feeble dyspeptic one of some importance. There is a very wide-spread belief that drinking vinegar is an efficacious means of avoiding getting fat; and this belief would appear, from these experimental observations, to be well founded. If the vinegar be taken at the same time as farinaceous food, it will greatly interfere with its digestion and assimilation.

Effervescent table-waters, if they consist simply of pure

water charged with carbonic acid, exercise a considerable retarding influence on salivary digestion; but if they also contain alkaline carbonates, as most of the table-waters of commerce do, the presence of the alkali quite removes this retarding effect.

With regard to "peptic" digestion, the results are still more surprising. It was found that with ten per cent. and under, of proof-spirit, there was no appreciable retardation, and only a slight retardation with twenty per cent; but with large percentages it was very different, and with fifty per cent. the digestive ferment was almost paralyzed. It was also observed that the weaker forms of alcoholic drinks (wine and beer) differed greatly in the influence on peptic digestion from that of the distilled spirits. They retarded it altogether out of proportion to the quantity of alcohol they contained. Port and sherry exercised a great retarding effect. Even in the proportion of twenty per cent, sherry trebled the time in which digestion was completed. It should further be borne in mind that this wine also retards greatly salivary digestion. Sherry, then, is injurious for persons of feeble digestive powers. With hock, claret and champagne, it was also ascertained that their retarding effect on digestion was out of proportion to the alcohol contained in them; but champagne was found to have amarkedly less retarding effect than hock and claret, due apparently to the mechanical effects of its effervescent qualities. The quantity of claret and hock often consumed by many persons at meals must exercise a considerable retarding effect on peptic digestion; but small quantities of these wines (and even sherry) may not produce any appreciable retarding effect, but act as pure stimulants.

With regard to malt liquors it was observed, as with wines, that they retarded peptic digestion in a degree altogether out of proportion to the amount of alcohol contained in them: and, when taken in large quantities, they must greatly retard the digestion, especially of farinaceous food.

Tea, coffee and cocoa were found to exert varying de-

grees of influence on the salivary digestion. The medium strength of the tea usually drank is estimated at four to five per cent; strong tea may contain as much as seven per cent; weak tea, as little as two per cent. Medium coffee has a strength of about seven per cent, and strong coffee twelve to fifteen per cent; cocoa, on the other hand, is generally weaker, not more than two per cent, and this may be one reason why it is more suitable to persons with feeble digestions than tea or coffee. Tea exercises a powerful inhibitory effect on salivary digestion, and this appears to be entirely due to the large quantity of tannin it contains; and, in order to diminish as far as possible its retarding influence on salivary digestion, it should be made weak and used sparingly, and it should not be taken with, but after the meal. Coffee, unless taken in very large quantity, has very little retarding effect on salivary digestion; this is explained by the fact that the tannin of tea is replaced in coffee by a substance called *caffeo-tannic acid*. Cocoa resembles coffee, and has little or no effect on salivary digestion; the use of coffee or cocoa is therefore preferable to that of tea for persons of feeble digestion.

With respect to the influence of tea and coffee on stomach digestion, it was found that they both exercised a remarkable retarding effect. There was no appreciable difference in the two beverages if they were of equal strength; but, as coffee is usually made of greater percentage strength than tea, its effect must ordinarily be greater. Cocoa also had much the same effect if used of the same strength as tea or coffee; but when of the strength ordinarily employed, its effect was inconsiderable. Strong coffee—*café noir*—had a very powerful retarding effect, and persons of weak digestion, should avoid the customary cup of "black coffee" after dinner.

Perhaps one of the most unexpected results of these experiments was the discovery that beef-tea had a powerful retarding effect on peptic digestion, as much so as that of a five per cent. infusion of tea. Further researches appear to show that this retarding effect of beef-tea was due to the

salts of the organic acids contained in it. Beef-tea contains but very little nutritive properties, and must therefore be looked upon rather as a stimulant and restorative than as a nutrient beverage, but it is nevertheless very valuable on account of those properties.

The author holds the view that, in healthy and strong persons, the retarding effect on digestion, observed to be produce by many of the most commonly consumed food-accessories, answers a distinctly useful end. They serve, he maintains, the purpose of wholesomely slowing the otherwise too rapid digestion and absorption of copious meals. A too rapid digestion and absorption of food may be compared to feeding a fire with straw instead of slower burning coal. In the former case it would be necessary to feed often and little, and the process would be wasteful of the fuel; for the short-lived blaze would carry most of the heat up the chimney. To burn fuel economically, and to utilize the heat to the utmost, the fire must be damped down, so as to insure slow as well as complete combustion. So with human digestion; our highly prepared and highly cooked food requires, in the healthy and vigorous, that the digestive fire should be damped down, in order to insure the economical use of food. We render food by preparation as capable as possible of being completely exhausted of its nutrient properties; and, on the other hand, to prevent this nutrient matter from being wastefully hurried through the body, we make use of agents which abate the speed of digestion.

These remarks will apply, however, only to those who possess a healthy and active digestion. To the feeble and dyspeptic any food-accessory which adds to the labor and prolongs the time of digestion must be prejudicial; and it is a matter of common experience that beverages which in quantity retard digestion have to be avoided altogether by such persons, or partaken of very sparingly.—*Science*.

Editorial, Etc.

A DEFENSE OF ENGLISH DENTISTRY.—An editorial in the London *Dental Record* under the title of "An Insult to British Dentistry," exonerates Americans from being the instigators of the following article which appeared in a pamphlet under the name of "A Few Remarks on American Dentistry in England."

"The ordinary English dentists are men who have had no hospital education, in fact no opportunity of seeing thoroughly good operative or artistic dentistry, whose time has been spent in making artificial teeth in perfect rows in the laboratory or work-room of some other dentist, and having saved a little money they start in practice themselves.

"In the two Dental Hospitals in London, which are the best schools for English dentists, thousands of teeth each year are extracted that should and can be saved, which is not only a disgrace to the dentistry of England, but it teaches the young dentist to put no value on their patients' teeth.

"Those who do value their teeth and wish to save them are cautioned to avoid the ordinary English dentists, and to assist in protesting against either having teeth extracted themselves or permitting others to have them extracted."

Commenting upon the above, the *Dental Record* says :

The foregoing paragraphs are downright insults to English dentists, to teachers of dentistry in England, and to the intelligence of the English people. There is reason to believe that they who are responsible for these gross libels are not Americans. Certainly no one with the least regard for a possible reputation, or for other than purely personal motives, would utter such statements. The article of the *Medical Press* will receive the general approval of the dental profession; but,

alas! the unwary public will require many such remedial measures ere it will sing, "Quacks shall no more have dominion over us, but true Heroes and Healers!" The names of the authors of this advertising medium are not to be found in the Dentists' Register.

AMERICAN DENTISTS ABROAD.—Consul-General Raine, at Berlin, informs the Department of State that the Prussian minister of the interior and medicinal affairs has recently issued an order whereby dentists who have graduated in the United States are prohibited from practicing as "royally licensed" dentists. They can procure, however, a regular "trader's license," and practice under the same. They are prohibited entirely from establishing or opening dental dispensaries, (clinical institutions,) where practical dentistry is taught, but may receive patients for treatment. Licensed American dentists may be allowed to give instruction in technical dentistry, but are prohibited from lecturing and teaching dental surgery generally, or to give their places the character of a medical school, unless previously authorized to do so by the government.

A correspondence some years ago with the Hon. James G. Blaine, the Secretary of State, in regard to the status of diplomas from reputable American Dental Schools, revealed the fact that there is a disposition on the part of the German Officials to discountenance the practice of German students leaving their own country for better educational advantages. This action of the Prussian Minister of State will not, however, affect the standing of American educated dentists who may locate in Germany, as naturally their operations must in the end influence such practice, and maintain the high reputation in which the well educated practitioner is held throughout Europe.

Monthly Summary.

OXYPHOSPHATES AND TEMPERATURE.—A very troublesome obstacle to success in the use of the oxyphosphate cements will often be found in the temperature of the air, an elevated temperature so hastening those chemical changes upon which the hardening of these cements depends as to render their use almost impracticable. This difficulty is likely to occur only in the hotter seasons of the year, and can readily be overcome by placing the mixing-slab, as well as the acid and oxide bottles, in cold water until their temperature has been considerably reduced.

During severe winter weather too low a temperature also gives trouble, the acid and oxide, even when the former is in some excess, forming a powdery mass utterly unworkable but which melts down into an almost fluid condition when brought into contact with the warmth of a tooth *in situ*. A temperature between 60° and 65° F. secures the best results in mixing oxyphosphate cements.—Litch, in *Dental Cosmos*.

DISCOLORATION OF GOLD FILLINGS.—"We learn from the *Odontographic Journal* that the result of Dr. S. P. Palmer's researches into the causes of gold fillings becoming discolored seems to establish the fact that iron is the chief agent. Cabbage or other vegetables cooked in an iron pot, or water drawn from an iron tank, accounts for some cases of discoloration. Iron exhibited in combination with the mineral acids, in physician's prescriptions, may also discolor fillings. Dr. Watt once called attention to the fact that the gold-beater's vellum may communicate foreign mineral particles to gold foil.

Dr. Palmer's theory will no doubt appear more plausible to the dentist who does not believe in shouldering more than his share of responsibility."

The above is an editorial in the February number of the *Cincinnati Medical and Dental Journal*. Long ago Dr. A. M. Leslie gave his opinion, at a meeting of the Mississippi Valley Association, that a certain peculiar coloring on gold fillings was due to a trace of iron in combination with the gold. Either by appointment or private agreement it became understood that Dr. L. and the writer would give the subject special attention. We both became well convinced that Dr. L's theory was correct. When preparing gold for crystallization, in former years, we found it necessary to give special care to the removal of all traces of iron, or the coloring referred to would be found on gold fillings in all mouths containing cyanide of sulphur, sometimes called sulpho-cyanogen. We presume this is the same kind of discoloration spoken of above. It is due to iron.—*Ohio State Journal of Dental Science*.

DANGER FROM THE BICYCLE.—Each new development in the mechanical arts of civilization seems to bring with it its own especial disease. Even the pleasures and recreations of the student or the business man often bring, with the improvement in general health, a diseased action in some special organ which is by chance thus subject to some undue strain or irritation. The public is beginning to understand the danger of heart strain that comes to the student with the increased muscle and apparent vigor which result from the training for the college regatta.

The disease which will be induced by the use of the bicycle is not so well understood. The horseman, after his fortieth year, is apt to show symptoms of disease of the prostate gland. It is the result of the pressure of the saddle against the gland. The pressing and the jarring create an irritation, which passes into a chronic congestion, then glandular hypertrophy, with mechanical obstruction to the free escape of urine, a bladder developing a chronic cystitis from the retained and decomposing fluid, a secondary kidney affection, and death. The extra

risk of development of this line of disease to the horseman is well known. Yet the saddle which he uses affords quite a broad, secure seat. If one examines the saddle or seat of the bicycle, however, he finds a narrow support of only a few inches for the whole weight of the body. A wider saddle is not possible, as it would interfere with the free use of the feet on the pedals. The horseman, upon the broad saddle, has the additional advantage that the weight of the body rests principally upon the firm tuberosities of the ischii, while with the bicyclist, owing to the narrowness of the saddle, the weight comes upon the perineum, and is transmitted directly to the prostate gland and base of the bladder. If the horseman develops a tendency beyond that of the average of men to trouble with the prostate and urinary organs, the habitual user of the bicycle must develop to a much more marked degree the same tendency, and the result of a general use of the bicycle must be an equally general tendency to hypertrophy of the prostate with its attendant ills.—*Southern California Practitioner.*

WHITE OF EGG IN OBSTINATE DIARRHŒA.—From *Allg. Med. Cent.-Zeit.* we learn that Celli has recently called attention to the curative properties of the albumen of hen's eggs in severe diarrhœal affections. In a discussion before a medical society at Rome, he advocated its use, and related two cases of chronic enteritis and diarrhœa which, having resisted all treatment, speedily made complete recoveries under the use of egg-albumen. The same diet is strongly recommended in the diarrhœa accompanying febrile cachexia and in that of phthisis. In two cases of diarrhœa dependent upon tertiary syphilis, it was of no avail. On post-mortem examination diffuse amyloid degeneration of the arterioles of the villi was found in these cases. The whites of eight or ten eggs are beaten up and made into an emulsion with a pint of water. This is to be taken in divided quantities during the day. More may be given if desired. The insipid taste can be improved with lemon, anise, or sugar. In case of colic, a few drops of tincture of opium may be added.—*Epitome.*

A DOCTOR'S LUCK.—The *Phila. Press* states that Dr. Thomas C. Stellwagen, a dentist of that city, and a resident of Media, Pa., has come into the possession of a handsome fortune by the death of his aunt, the widow of the late Dr. Dickey, of Atlanta, Ga. The story goes that Mrs. Dickey, assuming to be in want, addressed letters to relatives in Maryland and Pennsylvania, soliciting aid, but that Dr. Stellwagen was the only one who responded favorably. He sent her two checks for \$50 each, and wrote that he hoped his small contributions would help her. Three months ago Dr. Stellwagen received a letter from his aunt saying she was very sick, and requesting him to come to Atlanta. He obeyed the summons, and when he reach Atlanta was dumbfounded to find that Mrs. Dickey was living elegantly and that she was wealthy. She told him that she wouldn't live long; that she wanted to go home with him, and it is said deeded everything to him, and made him a present of all her household furniture, silverware and jewels. It is also said that the professor left behind him in the Southern city a row of handsome dwelling-houses. Two days after reaching the Doctor's home in Media Mrs. Dickey died.

ARTIFICIAL IVORY.—An extensive industry has arisen in France to supply an artificial substitute for natural ivory in view of the growing insufficiency of the latter to meet the demands of art and industry. The majority of the products formerly employed were obtained by injecting whitewood with chloride of lime under strong pressure. At the Amsterdam exhibition, however, almost all the products had been prepared with the bones of sheep and waste pieces of deer and kid skins. The bones are for this purpose macerated and bleached for two weeks in chloride of lime, then heated by steam along with the skin, so as to form a fluid mass, to which are added a few hundredths of alum; the mass is then filtered, dried in the air, and allowed to harden in a bath of alum, the result being white tough plates, which are more easily worked than natural ivory.

REPAIRING A CRACKED PLATE.—Occasionally I have to repair a cracked plate; whenever I do, I use what is known to jewelers as earring wire—it is a brass wire gold plated—I pro-

ceed in the usual way till about to pack in the new rubber, when I make a hole sufficiently large to receive the wire each side of the crack as far away from the crack as the outer edge of the patch, then take a piece of the wire and bend one end at a right angle; get the distance between the holes and cut the wire to the proper length and bend the other end at a right angle also, making a broad staple. I put the ends in the holes, letting them go clear through the plate, unless it is quite thick then pack the rubber over and proceed as usual. If the wire projects through the plate cut or file it off.

In this way a plate may be repaired and be as thin when done as it was originally, and stronger, thus avoiding a clumsy patch. Two or more of such staples may be put in as the case demands. This method was given me by Dr. Abbott, of Dwight, Ills.—*Items of Interest.*

SHARPENING CORUNDUM WHEELS.—I find after using awhile, my corundum wheels seem to be glazed and do not take hold and cut as readily as they used to.

One day, when particularly bothered, I suddenly remembered that the wheels were made with shellac. Alcohol is a solvent. I placed the wheel in a horizontal position, poured a spoonful of it on, then using a stiff brush scrubbed the face of the wheel, laid it aside to dry thoroughly, and when I used it again found it nearly equal to a new one. This can be done as often as they get dull, being careful not to use till thoroughly dry.—*Items of Interest.*

GOLD SOLDER.—The following formulæ for gold solder is given by Dr. McKellops :

Gold,	89 parts,
Copper,	4 parts,
Silver,	7 parts.

This solder will not show on the plate. It should be reduced in the same proportion as the gold is reduced for making it.

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ARTICLE I.

THE MUCOUS MEMBRANE OF THE MOUTH.

*With special reference to its Physiology and Pathology, and
the part played by its Secretions in the production
of Dental Caries.*

BY EDWIN A. CORMACK, L. R. C. P. & S., L. D. S. EDIN.

The subject of the mucous membrane of the mouth is an important one, the whole significance of which has been greatly underrated by the dental profession till within the last few years. In the opinion of many eminent observers its secretions are important factors in the causation of dental caries.

To understand the rationale of their operation we must possess a correct knowledge of the connections of the mucous membrane with other parts, its functions and the agencies which its secretions are subjected to in the mouth. In order to fulfil this object systematically we will discuss

in succession its anatomy, physiology, and pathological anatomy. The special diseases of the gum I have reserved

for discussion at a future period.

Having referred to the anatomy of the mucous membrane and the gum, of the physiology the author says:—The mucous membrane yields a secretion—mucus. The mucus is derived from certain of the epithelial cells which elaborate it within their protoplasm and then extrude it.

Lymphoid elements also escape from the mucosa, and passing through the epithelial cells, reach the surface and form the swollen spherules known as mucus corpuscles.

Mucus is a colorless viscous fluid. It contains the debris of shed epithelium, mucus corpuscles, and mucin.

Mucus corpuscles are nucleated masses of protoplasm, similar in size to white blood corpuscles, but containing, unlike the latter, one or more nuclei. Even at the normal temperature, they exhibit amœboid movements. These cells are probably modified epithelial cells of the columnar variety. Mucin is an albuminoid substance that occasions the viscosity of mucus fluids; it thereby facilitates the passage of food over mucous surfaces. It is not coagulated by heat, but is precipitated by alcohol and acetic acid. The precipitate is not soluble in excess of the acid. The precipitate swells up in water, but is not dissolved in it; it is however, readily soluble in alkalies.

Mucin is largely produced in the mucous glands, and the secreting cells of the salivary glands, especially in the sub-maxillary and sub-lingual. Mucin, in composition, differs only from albumin in containing no sulphur. Albuminoids contains C. H. O. N.; like proteids, they yield leucin and tyrosin, one or both, when subjected to hydrolytic treatment. Albuminoids readily decompose into a number of simpler bodies.

GENERAL PATHOLOGY OF MUCOUS MEMBRANE.

The diseases of the mucous membrane of the mouth are generally of an inflammatory character, and are most

common in childhood, resulting usually from intestinal disorders, bad hygiene, and want of local cleanliness.

Inflammations may also be induced by noxious substances acting on the external surface of the membrane. The intensity, extent, and duration of the inflammations vary greatly; and a number of different forms are distinguished accordingly.

Inflammations may be divided into acute and chronic, and, according to their character, into catarrhal, croupous diphtheritic, and gangrenous.

Hyperæmia is very commonly met with in the mouth—where it is of long standing, it may be referred to the atonic condition of the walls of the blood-vessels from malnutrition. The mucous membrane becomes intensely reddened, and, at the same time, the secretion is increased.

In catarrhal inflammations, the characteristic feature is a morbid increase of the secretion of the membrane. The catarrhal secretion is furnished partly by the blood-vessels and partly by the epithelial cells. There is an exudation from the capillaries of liquor sanguinis, containing numerous white blood corpuscles. This exudation is always mingled with secretions from the epithelial cells. These cells normally produce mucus from their protoplasmic contents, the columnar cells chiefly; in catarrh this is much increased. Great quantities of glassy mucus are thus deposited on the membrane along with the normal secretion of the mucus glands.

The inflammation may now subside, and the membrane recover. But should any further irritation arise, other changes will take place. The epithelial cells begin to be shed, and secretion is rendered turbid by their presence, then we have what is termed epithelial catarrh.

In the later stages, there is an excessive desquamation of the epithelium and an abundant extravasation of the white leucocytes. Many forms of catarrhal inflammation are thus characterized by an almost purulent secretion, and are described as purulent catarrh.

Catarrhal inflammations are usually transient; sometimes, however, the process becomes chronic.

In addition to the alterations in the secretion and the epithelial cells, there is an infiltration of cells into the mucosa, and sometimes into the sub-mucosa. Where the epithelium has been lost by desquamation, repair is effected by multiplication of the remaining epithelial cells.

The inflammation may, however, become intensified, so that the tissues perish over some considerable extent. When the infiltration is extreme, the tissue perishes by necrosis. In this way ulcers are produced. The lymph follicles are often the seat of inflammation and ulceration. Ulcers starting in them are known as follicular ulcers. When catarrh passes into ulceration, the inflammatory exudation usually extends far beyond the limits of the ulcer.

When the inflammation is of long duration, a certain amount of fibrous hyperplasia takes place. The openings of the glands often become obstructed, and they are thus distended into cysts.

INFLAMMATORY AFFECTIONS OF THE MOUTH.

The slightest degree is known as *Erythema*. It is characterized by redness, sense of heat, and sometimes considerable tenderness, but is not usually attended with acute pain. This may rapidly disappear or pass into the more severe form known as

Catarrhal Stomatitis. In this form the surface is intensely red, the secretion of the membrane is increased, and the epithelium desquamates. Over the surface of the gums, lips, and cheeks, the redness and swelling are generally uniform, but in the hard palate they may appear in streaks and patches.

When the inflammatory exudation is abundant, clear vesicles are sometimes found on the tongue, lips and cheeks, where the epithelial covering is thicker than elsewhere, and prevents the free escape of the exuded liquid. As the vesicles break, small ulcers, covered with a whitish film of

detritus, may be formed in their place. The mucus glands become swollen, giving rise to greyish or greyish-red elevations surrounded by a reddened areola. When the duct becomes obstructed with mucoid cells, the gland may be dilated into a tiny cyst by the retention of its secretion.

The catarrhal secretion contains at first few cells, but later the proportion becomes increased. The cells are in part extravasated leucocytes, in part desquamated epithelial cells. If the latter remain on the surface they may accumulate so as to form a whitish or discolored grey and brown deposit or fur.

When the gums are involved they swell and rise up between the teeth, around the necks of which they ulcerate. In some cases this ulceration does not cease until it has extended into the alveoli and destroyed altogether the connections of the teeth, which become loosened and fall out.

Catarrhal stomatitis is generally the result of some mechanical or chemical irritation of the mucous membrane; when the irritation is local, like that caused by a carious tooth, the stomatitis is likewise local. There are many diseases which set up inflammation of the mouth. In measles a muscular eruption appears, in scarlet fever a punctate, or diffuse scarlet eruption. In small-pox, chicken-pox, pemphigus, and in foot-and-mouth disease there are eruptions of vesicles and pustules, which pass through the same stages as those of the skin.

Simple catarrhal inflammation frequently occurs during the period of dentition, when it is often accompanied by fever.

Erysipelatous Inflammation may extend from the skin to the mouth, or may begin in the mouth, caused by direct action of irritant bodies, as by scalding drinks, acrid or corrosive substances taken in the mouth. It is characterized by livid redness and much swelling, and sometimes even vesiculation. The tongue is the part most affected.

Apthous Stomatitis is distinguished by the appearance on the catarrhal mucous membrane of small whitish or slightly

yellowish patches (apthæ) from the size of a millet seed to that of a pea.

They are surrounded by a livid border and may coalesce into larger patches. These apthæ consist of a solid exudation lying between the fibrous tissue and the epithelium—(Bohn). The exudation may be re-absorbed and the apthæ then disappear, or the epithelial covering is broken through, the fibrinous film exposed, and gradually separated by the growth of epithelium advancing beneath it from the margin.

As the epithelium is reproduced simultaneously with the separation of the fibrin, no ulcers are in general produced. The eruption occurs in successive crops, and may thus be kept up for weeks.

It occurs chiefly in children who are teething. It also occurs in connection with sore throat, pneumonia, gastric catarrh, the acute exanthemata, diphtheria, ague, whooping-cough.

This affection has no connection with any invasion of fungi.

Ulcerative Stomatitis is an affection which always starts from the alveolar margin of the gums—(Bohn). It begins with redness, swelling, and loosening of the gums around the teeth. The alveolar border becomes rounded and swollen, with blunt processes rising up between the teeth. Hæmorrhage is not uncommon at this stage. In the second stage the margin of the swollen gum becomes discolored, and the tissue softens and breaks down into a yellowish friable mass—ulcers are thus formed, which rapidly deepen. The ulcerative process may extend directly to the contiguous parts of the cheek and gums, and may work downwards till it attacks the periosteum of the bony structures, leading to necrosis.

The affection is usually acute—children are especially liable to it. It attacks people who are badly nourished or debilitated by disease, such as scrofulous disorders, intestinal complaints, typhoid, diabetes or scurvy; damp, cold, and impure air favor its appearance.

Local irritations may lead to it, as in cases of chronic poisoning by mercury, phosphorous, lead, and copper. The form, which is due to long continued phosphorous poisoning, is apt to extend deeply into the tissues, and so give rise to periostitis and necrosis of the bones.

Noma or cancrum oris is an allied but more severe disease. It may begin as an ulcerative disease, or appear independently. In the former, the disintegration of the tissue of the gum extends rapidly, and the tissue breaks down into pulpy gangrenous mass.

In the latter, the first symptoms is the appearance of a livid swelling on the inner surface of the cheek, near the angle of the mouth, accompanied by the free flow of foul saliva; a patch of greyish yellow infiltration then appears, and this speedily breaks down and becomes gangrenous.

As the disease progresses, a purplish spot appears on the outside of the cheek, this becomes black, and gangrene sets in and spreads. It is generally confined to one side. Once the gangrene has commenced, it may spread to a considerable extent, advancing very rapidly: noma is generally fatal. It attacks poor and debilitated children, usually between the ages of two and twelve.

Suppurative inflammation of the mucous membrane of the mouth and partly underlying it should be distinguished from ulcerative stomatitis and noma. It may affect any part but appears most commonly in the tongue and gums. In the latter, it frequently arises in connection with carious teeth. The gum becomes red and swollen, and, presently, pus forms beneath the surface. This is termed a gumboil.

Croupous Stomatitis.—When the mucous membrane is so injured that its epithelium is destroyed here and there, and its blood-vessels so much injured as to allow of free exudation of their contents, coagulation of the latter may take place. This forms a false membrane, consisting of fibrous filaments and granules, beset with pus cells or of shining homogeneous blocks representing cells that have undergone coagulative necrosis.

The false membrane is connected with the underlying structures by fibrinous filaments; but can be readily pulled off, showing the reddened surface of the mucous membrane beneath. To produce coagulation, the exudation must be of an inflammatory nature and the cells necrotic.

Diphtheritic Stomatitis.—When a mucous membrane is injured in such a way that its epithelium dies without desquamation, while its blood-vessels are damaged and pour out an abundant exudation, it sometimes happens that the dead epithelial cells become saturated with the exuded liquid, and then pass into a peculiar condition of rigidity resembling coagulation.

The seat of this change appears as a dull grayish raised patch, surrounded by red and swollen mucous membrane. The exudation, is rich in albumen, and the cells take the form of a kind of coarse network. The sub-epithelial areolar tissue is beset with filaments of fibrin and leucocytes. Hæmorrhages are not uncommon.

Inflammations of this kind, in which the tissue itself coagulates into a solid mass, are called diphtheritic: and when the necrosis and coagulation extend only to the epithelium the affection is called superficial diphtheritis. Inasmuch, then, as the croupous membrane consists essentially of coagulated exudation, croupous inflammation is at once to be distinguished from superficial diphtheritis, in which the epithelium coagulates *en masse*.

Deep or parenchymatous diphtheritis is characterized by the coagulation not merely of the epithelium but also of the underlying connective tissue.

Wedl states that this affection gives rise to a general inflammation of the root membranes over the whole row of teeth in the upper or lower jaws.

"Croupous inflammation of the gum is an affection of considerable importance, both on account of its sudden occurrence and also because it is liable to assume a diphtheritic character."

"In the first stage the edge of the gum is covered with

a whitish-grey membraniform exudation. . . . The mucous membrane deprived of its epithelium is slightly swollen, tender to the touch, and bleeds easily." Generally the exudation appears upon the margin of the lower jaw which faces towards the lips and cheeks, whence it spreads gradually over the whole anterior and posterior edges of the gums. The exudation degenerates very rapidly into an offensive, sanious mass.—(Wedl.)

PARASITIC AFFECTIONS.

The oral cavity is always infested by a multitude of vegetable micro-parasites which gain entrance to it from without, and find in it a fitting soil for their growth.

Moulds, yeasts, and bacteriae are all met with ; of the latter micro-cocci and sarcinae occur, as wells as bacilli and spirilla. Where cleanliness is not observed, they may occasionally set up putrefactive decomposition. Measles, scarlatina, small-pox, diphtheria, &c., all give rise to inflammatory conditions of the mouth ; and as we regard these diseases as due to micro-parasites, we must assume that the corresponding pathogenous organisms gain access to the tissues of the mouth. .

Saccharomycis albicans—muguet, or thrush fungus—is a special fungus of the mouth, generally referred to as *Oidium albicans*. It is one of the yeasts, and is therefore akin to the *mycoderma vini* (mother of vinegar) or *saccharomyces cerevisiae*. The scum which forms on the surface of alcoholic liquors, and leads to their transformation into vinegar, contains this yeast fungus—the mother of vinegar. Yeast cells not only set up fermentation directly, but they yield an unorganized ferment which changes cane sugar into grape sugar.

They have no power of invading living tissue and are of little pathological importance, and it is only under specially favorable conditions they are able to grow freely. There is usually no great supply of fermentable saccharine matter available for them. The presence of acids does not

check their development. Although probably always present in the mouth, the sub-epithelial tissues are only invaded when by antecedent changes, constitutional or other, the resisting power of the tissues has been considerably diminished. As it occurs in the mouth, it assumes the form of rounded or oval cells, seldom filaments. It gives rise to minute, whitish, slightly raised specks on the mucous membrane. They are generally to be found on the inner surface of lips and over the tongue. As they grow they coalesce into whitish films. After a time the film is cast off, the surface beneath appearing red and sometimes eroded. The fungus grows mainly in the middle layers of the stratified epithelium. From this position the fungus may penetrate into the deeper layers and reach the fibrous structure. Its progress downwards is marked by inflammation.

Thrush is a disease which manifests itself in very young children, and in adults debilitated by exhausting diseases. Its growth is favored by the use of cows' milk or starchy food, and by imperfect cleansing of the infant's mouth.

HYPERKTROPHY AND ATROPHY.

The epithelium of the mouth is constantly being shed and continually renewed by regenerative multiplication. In catarrhal affections this shedding is a prominent feature, and deposits are formed on the surface of the mucous membrane. This deposit is added to by the remains of food and by rapidly growing fungus parasites. In this way a continuous film or fur is produced.

Hyperplasia of the connective tissue is due either to some chronic inflammatory cause or to congenital conditions.

Inflammatory hyperplasia is most commonly met with in connection with the gums. It gives rise to circumscribed tumor-like thickenings.

Atrophy of the gums and of the alveolar parts of the jaws is apt to follow upon the loss of the teeth, and is normally present in old age.

The results, then, of our investigations into diseases of

the mucous membrane show that they are for the most part of an inflammable character, caused in some cases by direct action of irritants taken into the mouth, in others by disorders acting initially at more distant parts of the alimentary canal. We have also seen that the characteristic eruptions of the exanthemata make their appearance in the mouth; that a weak habit of body predisposes, and that malnutrition and bad hygiene are important factors in their causation. Parasites also contribute their evil influences.

Inflammation, if slight, increases the secretions; if more severe, it impairs the vitality of the mucous membrane by desquamation of its epithelium and interruption of its functions. It may destroy the epithelial covering, and even the underlying tissues, by infiltration, ulceration, or necrosis.

By infiltration or by hyperplasia it may produce obstruction of the gland ducts, and consequent cysts; or, where the processes are excessive, total obliteration.

INFLUENCE OF THE SECRETIONS OF THE MUCOUS MEMBRANE ON THE PRODUCTION OF CARIES.

From the earliest times the causation of caries has occupied the attention of those who devoted themselves to dental pathology. Since the time of Vespasian (90—120 B. C.), when Aretæus confessed that "the cause of toothache is known only to God," many investigators, more enterprising than he, have made innumerable observations and propounded theories more or less satisfactory. It was known about the beginning of this century that certain acids found in the mouth were capable of decomposing the teeth; but caries was generally believed to be due to some inflammatory agency situated within the tooth, hence the term *caries interna*.

In 1835, Robertson of Birmingham considered that caries was due to "the corrosive chemical action of the solid particles of food which had been retained, and have undergone a process of putrefaction or fermentation in the several parts of the teeth best adapted for their reception."

Since then numerous theories have been advanced. Mr. Tomes, in 1859, advocated the chemico-vital theory. He believed that acids, whose origin he referred to the mucous and saliva, resolved the tooth into its histological elements, and that the dentine exerted a resistive force, or alternatively, that caries was to some extent inflammatory.

Magitot, in 1869, elaborated the theory of resistance and consolidation of dentine, but eliminated the idea of inflammation.

The year after, Leber and Rottenstein demonstrated the presence of leptothrix granules in the dentinal tubes. Hence they denied the reaction of dentine. To caries of the enamel they ascribe a chemical cause.

In 1870 Wedl verified part of Leber and Rottenstein's experiments, but considered acid essential to the disease. He believed caries to be due to abnormal secretions of the oral membranes and salivary glands; and that in consequence of their fermentations, acids were formed which acted on the teeth.

In 1873 Tomes abandoned all idea of vital action as a part of caries, and regarded the calcification of the fibrils as doubtful.

In 1881 Underwood and Milles believed the disease to be due to micro-organisms; also that previous experiments showing caries to be due to acids were void, because septic conditions prevailed.

In 1882, Miller, of Berlin, demonstrated that micro-organisms do not precede decalcification, but that they are the cause of the disintegrations of the matrix after the removal of the lime salts by acids.

Mr. Mossman, of Iowa City—from whose articles on Dental Caries, published lately in the *Dental Cosmos*, most of the above account of the history of the different theories has been taken—sums up as follows:—

The vital or inflammatory theory of caries, an inflammatory disease having a central origin.

The chemical theory recognized the existence of acids in the mouth and their capacity to dissolve the lime salts.

The chemico-vital theory is a combination of the two above mentioned. According to this belief the acids act upon the inorganic tissues; the irritation is conveyed to the pulp, which reacts against the invasion of the disease by throwing out lime salts into the fibrils.

The parasitic theory. The enamel being removed by acids, the organisms penetrate the tubuli of the dentine and proliferate there, according to some writers, merely expanding the tubuli for the better penetration of acids, and, according to others, generating themselves an acid by their action upon the organic matter.

The chemico-parasitic theory. This gives to acids the first place, to their agency all decalcification is due. Following this process come the micro-organisms, which penetrate only when decalcification is sufficient to permit their advance. Then they are found in great numbers, and cause the putrefaction of the organic mass.

The chemico-putrefactive theory is the same as the above, save that the micro-organisms are only incidental to the putrefactive process, and have no part in the disease.

Messrs. Underwood and Milles describe the microscopical appearance of carious dentine as follows:—

“The tubes are filled with micro-organisms. They appear to penetrate the canals at first in single file, and then accumulate in vast numbers to encroach upon the matrix. Here and there a narrow line of bacteria or micrococci penetrate beyond the sphere of visible decay. Besides the disintegrated tissues and foreign particles, there is found abundance of *leptothrix buccalis*.

“The micro-organisms consists of micrococci, rod-shaped and oval bacteria, and short bacilli.

“The number of sections of carious teeth cut and examined is now so enormous, that observers feel justified in assuming that the presence of micro-organisms is indispensable to the process”—(Sewill). Acids are necessary for the primary decalcifications.

The sources of these acids may be referred to the pro-

cesses of fermentation and putrefaction, which are continually going on in the mouth.

Fermentation requires the presence of a ferment, which may be either organized, that is, living, or unorganized. Living ferments grow and multiply at the expense of the matters in which they occur. Yeast may be cited as an example of the former, and ptyalin of the latter. Moulds, yeasts, and bacteria, are all met with in the mouth. They gain access to it from without (Ziegler).

The mucous secretion and the secretion from the salivary glands combine to form mixed saliva. All starchy or saccharine substances taken into the mouth are converted into grape sugar by ptyalin.

Grape sugar, when acted upon by a yeast, the *torula*, undergoes alcoholic fermentation; the presence of the *bacterium aceti* induces acetous fermentation. Stomatitis and caries of the teeth have been observed to be especially frequent in the case of chronic drunkards, and it is probable that beer drinkers suffer more from these affections than those who indulge in liquors possessing a larger percentage of alcohol. May not the acetous fermentation of the liquor imbibed cause these conditions? Another yeast, the *mycoderma vini*, transforms the alcoholic products of the first *torula* fermentation into acetic acid.*

Milk is taken as food, acted upon by the *bacterium lactis*, lactic acid is produced.

Putrefaction also requires the presence of a ferment, and we know that the *bacterium termo* is that ferment—(Ziegler). Naegleli, Pasteur, Lister, and others regard putrefactive fermentation as the direct result of the vegetation of the bacteria. Bacteria, as they grow and multiply, withdraw from the nutrient liquid the elements they require

*Naegleli maintains that the *torula* and the *myco-derma* are not distinct species, and, according to Grawitz, the white patches, known as thrush, are due to the presence of the *myco-derma*, the mycellal filaments and spores of which are distinguished as belonging to the *Oidium Albicans*. (Ziegler).

for building up their cells. These are chiefly C. H. O. N. from carbohydrates and albuminoids. The necessary inorganic compounds are derived from salts containing sulphur, phosphorous, magnesium, and potassium. None of the bacteria can develop without water—(Ziegler).

When albuminoids undergo decomposition, we have formed formic, *acetic*, butyric, valerianic, caproic, and *lactic* acids; combined with ammonia, or other organic alkalies, leucin and tyrosin, sulphuretted hydrogen, carbolic acid, and various other substances. When proteids are entirely decomposed, there remains a substance rich in fats, in earthy and ammoniacal salts, phosphates, and nitrates. (Rutherford).

In hyperæmia of the mucous membrane, there is an excessive secretion of mucus. The chief constituent of mucus is mucin, an albuminoid substance, ready splitting into a number of simpler bodies. Animal substances are taken as food into the mouth. These are principally composed of albuminoids and fats. One of the products of their decomposition is lactose, which breaks up into lactic acid.

We may say, then, that putrefactive fermentation may be set up by the action of bacteria on the mucous secretion, either alone or along with remains of food. When the mucus is extremely viscid, it may determine the location of caries by causing the adhesion of food, &c., to particular surfaces.

In the two processes of fermentation and putrefaction, two acids—acetic and lactic—are formed. These both act powerfully on the teeth.

According to Leber and Rottenstein's experiments, a solution of acetic acid of the strength of 1 in 1000 decalcified in 17 days the enamel and adjacent dentine of a tooth placed in it; a 10 per cent. solution of lactic acid showed during the same time, a very decided action on another tooth. It is probable, then, that acetic and lactic acids, along with other acids, produced in the putrefactive decom

position of albuminoids, dissolve the lime-salts of the dental tissues.

Miller, of Berlin, states that micro-organisms are never to be found in any but decalcified tissues of the tooth, and this is probable, as bacteria cannot live without water, and it is difficult to believe that they can go on in advance without it.* We may, therefore, conclude that they await decalcification. When the dentine is reached, channels are hollowed out to admit the fluid collecting in the cavity behind. In this float the organisms, deriving nourishment partly from it and partly from the disintegration of the organic matrix, by this means producing, and setting free, the acids of putrefactive fermentation to continue the process indefinitely.

The exclusion of water, as a means of stopping the invasion of caries, has long been recognized, and the energies of successive generations of dentists have been devoted to the application of water-tight fillings.

We may conclude, then, that the secretion of the mucous membrane takes part in certain fermentative and putrefactive processes, when in sufficient quantity, either alone or in combination with saliva or foods. That micro-organisms superinduce putrefactive decompositions of albumin-

*Drs. Leber and Rottenstein, who, in 1877-78, published their researches on the origin of caries through the action of *leptothrix buccalis*, differ from Miller.

There is, they say, no manner of doubt that the elementary parts of the fungus penetrate into the interior of the canals, and there develop in a manner to acquire a relatively considerable diameter.

It also results from the very fact of the dilatation of the canals, that the appearance of the fungus is not accidental, and, that it is not by a purely passive action that it invaded the canals. It is necessary that there be a proliferation of spores infinitely minute and innumerable of the fungus to effect the dilatation of the tubules. It is, moreover, very important that the elements of the *leptothrix* should have, at a certain stage, a mobility of their own, in virtue of which they easily penetrate the interior canals. As for the rest, we have met in the canals with only the granular masses of the *leptothrix*, and never the filaments which appear to show themselves only at the surface. [The granular masses are probably only the disintegrated tissues.—E. A. O.]

oids; that such processes produce acids which act by decalcifying the dental tissues, and so make way for the micro-organisms found by Miller and others. That these organisms, by removing certain constituents of the organic matrix of the dentine, produce putrefaction, and consequent disintegration. That the locality of caries may be determined by the collection of organic matter on dental surfaces, coated with viscous mucous.

The section on pathology has been largely taken from Ziegler's Pathological Anatomy. I have also referred to the following works:—Salter—Dental Pathology and Surgery. Harris—Principles and Practice of Dentistry. Wedd—The Pathology of the Teeth. Tomes—Dental Surgery. Tomes—Dental Anatomy.—*Odonto-Chirurgical Society of Scotland*.—*London Dental Record*.

ARTICLE II.

PROBABLE OR POSSIBLE POISONING FROM DENTISTS' AMALGAMS.

BY A PHYSICIAN.

(Read before the Mississippi Valley Society)

* * * Sometimes the deluded victims prefer to be poisoned. Sometimes they dread the dire effects of the deleterious article, yet seem to be led on, as if by siren songs, to fatal results. At other times they seem indifferent, possibly through ignorance, but oftener because the injurious results are slow in progress and not violent in their manifestations. Even when the bad influences are liable to be transmitted from generation to generation the indifference remains. Posterity poisoned? Well, who cares? What has posterity done for us? * * *

Now the reader can understand that if a people and nation have been constantly and continuously poisoned for generations, they will learn to regard the effects of the poison as normal manifestations of life. For want of proper ventilation all are more or less poisoned by carbonic acid, and other exhalations from living bodies. Many are poisoned by tobacco, and the symptoms are not recognized as the legitimate effects of the drug, inasmuch as they are mild and common. Alcoholic poisoning, whether acute or chronic, though quite familiar, is often misunderstood, and the victims almost always ascribe the phenomena to other causes. Metallic poisoning is so insidious and so gradual in its effects that the victims are usually incredulous till ruined constitutions result. The printer ascribes his ills to confinement within doors, and if his peculiar pallor is referred to he suggests that the ink may account for it. And so it goes, and he who sounds an alarm for the purpose of arresting the evils, is regarded as a crank or a fanatic.

But to discuss all the varieties of popular poisoning would take too much time and space, and as this is intended for a dental periodical, I shall only inquire as to the possibilities and probabilities of mercurial poisoning from the use of amalgam cements in filling teeth. This is a hackneyed and unpopular subject; but I think it has not received that attention from physicians that its importance demands.

I suppose it is safe to assume that many hundreds of pounds of mercurial pastes are used by dentists in a single year. It is probable that more attention is given to the preparation of these pastes than formerly, and it is possible that this renders the danger from poisoning less. If any such danger exists it is widely diffused, for probably one half the adult population who still retain their natural teeth have more or less of this material in their mouths. And this general diffusion makes the subject very important to physicians, who are the recognized conservators of the health of society. And bearing this in mind, I have no apology to give to dentists for taking up the subject.

It would prove tedious to notice all the symptoms of mercurial poisoning, but at the start I will notice some of its manifestations on the nervous system.

Pereira says, under the head of "Neuroses Mercurialis" various symptoms, indicating a disordered condition of the nervous system, are met with in persons who have been exposed to the baneful influence of mercury; such as wandering pains (*neuralgia mercurialis*), a tremulous condition of the muscular system (*tremor mercurialis*), sometimes accompanied with stammering (*psellismus metallicus*), and occasionally terminating in paralysis (*paralysis mercurialis*), epilepsy or apoplexy (*apoplexia mercurialis*), to these Dietrich adds asthma (*asthma mercurialis*), of which he saw only one case, amaurosis (*amaurosis mercurialis*) and hypochondriasis (*hypochondriasis mercurialis*).

Pereira also says, under the head of "Cachexia:" "this condition is characterized by disorder of the digestive organs, loss of appetite, wasting, incapacity of much exertion, with increased secretion from all the organs; especially from the salivary glands."

Mr Travers, author of *Farther Inquiry Concerning Constitutional Irritation*, says mercurial cachexia is characterized "by irritable circulation, extreme pallor and emaciation, an acute and rapid hectic, and an almost *invariable termination in phthisis*." (Italics mine.)

In view of the fact that phthisis, or *consumption*, is more fatal to Americans than any epidemic pestilence, is not the last sentence worthy of the most serious consideration? And as the symptoms above detailed are very prevalent in our country, or at least many of these symptoms, it is not worth while to inquire if the very general wearing of mercurial compounds in the teeth is not explanatory?

Some general principles may be considered in this connection. It is doubtful if mercury or any other metal is poisonous. As long as it remains in the metallic state it is probably inert. Let the metal potassium illustrate. Grant that the metal is non-poisonous, yet indirectly its introduc-

tion may result in serious disaster. It has such a strong affinity for oxygen that it will burn briskly in water; and its oxide formed thus, or otherwise, is a caustic poison of deadly power.

Mercury combines with oxygen, forming two compounds, both poisonous. And all its compounds with non-metallic elements are poisonous, unless its sulphides are to be excepted. As these are but slightly soluble, some claim that they are non-poisonous or inert. But even if this is true, it does not follow that they can be used with safety, for they are readily decomposed, and thus the mercury may, in part, be taken from the sulphur by its affinity for other substances, and thereby poisonous compounds may be formed.

The facts that sulphur has a strong affinity for mercury, that the sulphides of mercury are not very soluble, and that many mouths, perhaps a majority, contain sulphur in the form of sulphuretted hydrogen, or cyanide of sulphur (sulpho-cyanogen) explains why we do not see more frequent and more violent poisonings from amalgam fillings than are observable. Metallic zinc is highly oxidizable, but the first resulting compound of the two elements, the sub-oxide of zinc, forms an insoluble coating on the surface of the metal, which shuts out remaining oxygen, thus arresting the process of oxidation. In like manner sulphur forms with the mercury of an amalgam filling, a protecting coat that to a good extent shuts out oxygen, chlorine, etc. Were this otherwise, it is doubtful if any could wear amalgam fillings with impunity.

But still, from the standpoint of the physician, it is difficult to see, that in view of the general use of mercury in filling teeth, cases of poisoning do not frequently occur. Of course very many, and probably a great majority of the cases are so mild in their results that the real cause is overlooked. The constitution has been so long overturned that its present is regarded as its normal position, and all the more in view of the fact that the overturning at the first was accomplished by such a gradual process.

In 1850 I was called to treat a young school girl for *paralysis agitans*. She had been under treatment by other physicians without benefit, and for several weeks I could see no improvement. After a time I saw that she had quite a number of amalgam fillings in her teeth, and these were promptly removed, after which she gained rapidly under treatment that had altogether failed before.

A strong man of thirty had in his mouth twelve large mercurial fillings. His physician decided that he was suffering from mercurial ptyalism. His salivary glands and his tongue were much swollen. The accompanying stench was sickening. When called for counsel I could but approve the diagnosis, and the history of the case proved its accuracy. These are but specimen cases, I have seen many others as well marked. Of course they are exceptions, for if such results were the rule the material would be promptly abandoned. Yet I have no doubt whatever, that many of the aches and pains complained of in society arise from mild, chronic mercurial poisoning.

I suppose amalgam fillings will continue to be used, but it is well to use them with open eyes. If some are injured, and many apparently escape all trouble, and certainly do escape serious results, it becomes an important matter to find out what peculiarities of constitution make them more objectionable. If this were well understood, it could be omitted in treating such.

I think all first-class scientific observers will recognize that there is some danger from this source; and if poisoning may so result, how is it that the poisoning occurs?

Dr. Talbot, of Chicago, in a paper found at page 123, vol. v., of the *Ohio Journal*, seems to think that a vaporization of the mercury is the prominent factor in this form of poisoning. Long ago Dr. Watt and others suggested chloridation of the mercury. The two views are perfectly compatible. By vaporization a greater surface of the mercury is exposed to chemical action, and therefore oxygen, and also chlorine have better opportunities to combine with it;

and it is well known that both the oxides and chlorides are active poisons.

Some have objected that the vapor theory will not hold because a temperature of several hundred degrees is required to vaporize mercury, but the statement was evidently made without thought. Water *boils* at 212° , but it vaporizes at all known temperatures, and in like manner mercury does not require the boiling point to convert it into vapor. Besides, mercury has such small capacity for heat that notwithstanding its high boiling degree, it is boiled with less heat than that required for water. A heat that raises the temperature of water but *one* degree, raises mercury *thirty* degrees. This in part explains its ready evaporation.

It has been claimed that evaporation does not take place from amalgam fillings in the mouth, because they weigh as much after the lapse of months as when first put in. It is natural to expect an increase of weight. Dr. Talbot, I think, claims that such increase proves porosity of the material, and is due to the absorption of water. But if chemical agents, as oxygen, sulphur or chlorine, combine with any of the metals, there must be an increase in weight.

But in many cases the buccal fluids hold soluble chlorides in solution. They usually, at least often, divide their chlorine with other elements for which it has an affinity. In this way chloridation of mercury may take place, whether it be in vapor or otherwise. And it is well known that mercuric chloride (corrosive sublimate) is very poisonous. Galvanic action within the mouth is usually met with a sneer when mentioned. I trust that as you made it the subject of your inaugural thesis when trying for the degree of D. D. S., you will not be too much prejudiced to listen to something said about it. A tin filling and a gold one may be so placed as to make a battery, the tin may thus be made positive and the gold negative. But that a current may be formed and electrolysis result, they must be connected by a conductor. The lips, gums and tongue may make such connection. Still, that a current may be formed,

one of the metals must be corroded. In this way any of the binary compounds of the buccal fluids may be decomposed. If chlorine is thus liberated it at once takes hydrogen from the water present to form hydrochloric acid.

But galvanic action and electrolysis may occur without such arrangement, even from a single amalgam filling. Let a fragment of commercial zinc be placed in water and a portion of the water is at once decomposed. The surface of the metal becomes quickly coated with an oxide and the action ceases. By adding a minute quantity of acid to dissolve the oxide as fast as it forms, the decomposition continues. Pure zinc will thus decompose water, but not so fast as commercial zinc, because the latter has diffused through it minute particles of iron and other metals. At the point of contact of the zinc with the iron, rapid action takes place, because of the galvanic action thus set up. And this is as truly electrolysis as anything known in science.

Now apply this to an amalgam filling in the mouth : Several metals are commingled, minute points of any metal acted upon more rapidly than other metals in contact with it, give us a series of minute galvanic batteries, each one having great decomposing power.

By lessening the space between the exciting plates of a battery one-half, its decomposing power is increased four fold. Now lessen the space to an infinitesimal distance, and we can scarcely estimate the power, it becomes so great in proportion to the space so excited from such small point. In this way the metal most readily corroded by chlorine suffers more than the others.

I have seen trouble from amalgam fillings totally different from anything yet named here. A man was wearing a gutta percha filling in a lower molar. His dentist expected to fill with gold in a few weeks or months. A traveling quack persuaded him he would lose the tooth unless immediately filled with gold. So he filled it nearly full with amalgam and finished with gold. The patient began to suffer at once, and was told that the distress would soon abate.

He called on his family dentist repeatedly and was angry because he would not relieve him without removing the filling, which he insisted was all gold. After two or three weeks of almost sleepless distress the plug was removed, with instant relief. Now this is not likely a case of "intrastomatic galvanism," but the trouble was probably caused by thermo-electricity.

I have seen cases like the above when gold and tin had been used in the same cavity. But this is not common, for these metals are often used together without any inconvenience. Unless one metal is corroded, no galvanic action can occur in such cases; and they bear no analogy to metallic poisoning.

Of course amalgam fillings will be used. They are too convenient to be laid aside. But I wish to suggest that physicians in diagnosing obscure cases; give more attention to this possible source of mercurial poisoning. It will not do to deny that poisoning sometimes occurs from this source. Many dentists of high repute, though using the cement, testify to seeing well marked cases. Other dentists express doubts about such poisoning because they have never seen cases of the kind; and one got letters from physicians who state they have never seen cases of such poisoning. But what does negative testimony amount to in a controversy like this? I know a dentist of thirty years' practice who has never seen an amalgam filling inserted yet he believes one has been used.

It is often maintained that the observers who claim to have seen mercurial ptyalism from this source are mistaken as to the cause. And some remind us that iodide of potassium can cause ptyalism similar to that from mercury. I believe that it can do so only when mercury has been previously lodged in the system.—*Cin. Med. and Dental Journal*.

ARTICLE III.

REPRODUCTION OF BONE.

BY JOSEPH KURTZ. M. D.

(Professor of Clinical Surgery in the Medical College of the University of Southern California. Read before the Los Angeles County Medical Society.)

The term "reproduction" (or regeneration) of tissue may be used to represent a physiological, as well as a pathological, process. In the first sense it implies a new formation of a part, which was lost as the result of a perfect normal action, like the shedding and regeneration of epidermic and epithelial cells, the eyelashes (which completely change every 100-150 days), or the reproduction of hair or nails after trimming them. In the second sense, we understand the new formation of such parts which have been removed by an operation, performed to relieve either disease or injury.

As I intend to consider only the reproduction of bone tissue, it is not necessary to say any more about the first class of regeneration, as my subject will deal only with pathological cases; and in this respect man has not been as favorable endowed by nature as the lower region of the animal kingdom. Here we see that reproduction is nothing strange: spiders regenerate legs, some fishes their lost fins, and some lizards their extremities, the whole inferior maxilla the tail and even the eyes. But poor *homo*, who stands as perfection in the scale of creation, cannot boast of anything like it, his power of reproduction is very limited. Unfortunately, we see no new legs grow after an amputation, nor eyes after enucleation, and we are generally quite satisfied if we obtain a reasonable repair of a diseased or injured part.

It is stated that bone tissue is distinguished by a high

degree of power of reproduction, but if we look for the new formation of an exact counterpart of the bone lost, whether by disease or injury, we are usually disappointed; we rarely find anything better than a substitute, which, perhaps, resembles the original but little.

The repair of a fracture is generally accepted as a perfect regenerative process; but, if we come to consider this process thoroughly, I think the term "reproduction" is hardly applicable to it. The effect of a fracture is always an inflammation, followed by an exudation of a plastic material, which results in the formation of callus: first, the external callus, derived principally from the periosteum—the inflamed soft parts, cellular tissue, muscles and tendons furnishing but a very small amount; second, the internal callus, derived from the medulla, which forms a sort of a uniting wedge, and later on, after about thirty or forty days, an intermediary callus is formed at the ends of the fragments which finally completes their union. Still later, the superfluous external callus is absorbed and smoothed down, the medullary callus disappears, and gradually the bone assumes more or less the shape of the normal type. It may also gain the full strength it possessed before the injury, but if you examine the place of union very carefully you will find marked differences between it and the rest of the bone: it is always of a more compact consistence. It is the result of an inflammatory action, the same as we see in the repair of a wound in the soft parts, and I think the term "cicatrix" would be more applicable here than "reproduction."

I will now turn your attention to the process of restoration of bone which has been affected with caries. After a thorough removal of all detritus and other septic influences the cavity begins gradually to fill up with osteo-plastic material in the same manner as the ulcer of the soft tissues fills up with granulations, either of these being the result of an inflammatory exudation. If the cavity of the carious bone has been large and superficial, we rarely find that the bone will be covered with periosteum, but the cicatricial

tissue of the soft parts will closely adhere to and so cover the bone. I think you will agree with me in this instance that the term "reproduction" is by no means the most suitable, and that the filling up of the cavity is again simply the result of a plastic inflammation. In caries of teeth no repair whatsoever takes place.

We shall now consider necrosis, a disease of bone, in connection with which the term "reproduction" (or regeneration) is more used than in the other conditions; in fact, new bony tissue must supply the place of the dead bone removed, if the patient should not be crippled for life. I think it best to begin here with a short description of the disease and see how the degeneration of the bone is brought about. Whether the necrosis be the result of an injury or of a periostitis or myelitis, due to syphilis, scrofula or tubercles, there always exists a sequestrating inflammation: the periosteum, being converted into a pyogenic membrane, is separated from the bone, while a fungating ostitis is set up in the bone, which forms the line of demarcation. The bone itself dies from a want of nutrition, and gradually a sequestrum forms which, when removed, leaves a cavity, small or large according to the size of the sequestrum, or also to the length of time of the disease. Generally at the time of removal of the dead bone we find that the periosteum has already done a good deal of work towards forming new bony tissue—indeed, by the time the sequestrum becomes completely detached we should expect a fairly formed involucrum, which may be hard enough to require the chisel and mallet, or the saw, to allow the extraction of the dead part. After the extraction the cavity left will soon be filled by an osteo-plastic material; again, the result of an inflammatory process, similar to the filling up of the cavity, in a carious bone, or, also, like the filling of an abscess cavity in the soft parts. This new formation of bony tissue does not exactly correspond to the size of the extracted bone, but frequently the substitute exceeds this in size and weight three or four times, and remains so. The most ex-

tensive osteo-plastic development we observe sometimes is central necrosis, and occasionally in cases in which the size of the sequestrum itself is but very small. Not rarely we meet with a very large involucrum of ivory hardness, to cut which may be very difficult, even with chisel and hammer, etc., to extract, perhaps, a sequestrum no larger than a small phalanx.

Not long ago I removed a piece of dead bone, from the femur of a man, scarcely an inch long and half an inch thick, while the bone with the involucrum seemed to me about three times as big as the femur of the other leg. Only a few days ago I operated on a man at the Sisters' Hospital before the class of students. I found a very thick tibia with a fistula running into it; the probe met rough bone, but no detached sequestrum. The man had been operated on before for the removal of dead bone at the Bellevue Hospital, N. Y. Though I could feel no detached bone, I felt sure I would find a large sequestrum; but, after enlarging the opening into the bone with chisel and hammer, I found nothing but a large bone abscess with a good deal of small detritus. This shows to you that new formation and defect do not always correspond. Again, we may find occasionally cases of partial or superficial necrosis, in which no involucrum forms at all, and in which hardly any osteo-plastic material appears. Such cases often heal like superficial caries, the soft parts cicatrixing over it and leaving a depression in the bone. It is not very seldom either that reproduction of bone remains defective in cases of total necrosis of a diaphysis with solution of continuity, and that such cases may result either in shortening of the bone or in a false joint. As the periosteum is principally concerned in the production of new bony elements we cannot expect sufficient reproduction of bone in any case where the necrosed bone is not surrounded by periosteum. These facts seem to me conclusive that reproduction or regeneration of bone in the true sense of the word does not take place in necrosis either, but that here also we find that the

defect is replaced by an osteo-plastic material, the result of a plastic inflammation again.

It is usually understood that joints are reproduced after exsection, and no doubt very favorable results are obtained as regards the usefulness of the limb after such operations. I have made quite a number of these operations, and confess that I felt very happy over my little success, and I take pleasure in showing to you here a few of the bones which I removed. This first one you will readily recognize as the head of a femur of a child. The patient was a boy, aged nine years, suffering from coxalgia in the third stage; he made an excellent recovery, and now runs over the plains of San Fernando perhaps a good deal faster than any of us here could, in spite of over an inch shortening. The second specimen here is, as you see, the head and part of the shaft of a humerus, taken from a man aged 45, who had been shot through the arm by Indians. The last time I heard from him he stated that he could pitch hay almost as good as before he was injured, but his arm was considerably shortened. There is a third specimen that is worth looking at, it is quite a large part of the inferior maxilla. The patient, from whom I removed this, had his jaw crushed by means of brass knuckles, which were applied to him by one of his friends. A very short time after removing this bone I had occasion to witness this patient chew a beefsteak, which was not by any means of the most tender kind.

Many more specimens I could produce here, but I am afraid I have taxed your patience too much already; but I may mention that most of those were exsected with good, and a few with bad, results. I have also seen many cases of exsections of joints of other surgeons, with various results, but neither these nor my own cases have ever convinced me that a joint of exactly the original type was reproduced. I have always endeavored, as much as practicable, to make my operations subperiosteal ones, and conducted the after-treatment with appliances so as to avoid deformity as much as possible, and in spite of all precautions

the limbs were shortened and the jaws were slightly deformed. I believe the epiphyses are rarely, if ever reproduced. In exsections of the kness and elbow-joints the results are not always very flattering; total ankylosis of the knee is frequent, and partial ankylosis of the elbow must often satisfy our ambition. At best we may obtain a pseudarthrosis, which may answer well enough, but I doubt whether you may ever find the condyles of the femur or the humerus regenerated. Neither is the new-formed cartilage the same as the normal cartilage of a joint; it has not the same brilliant white appearance, nor has its surface the exact shape of the lost one. It consists rather of a fibrous tissue interspersed with some hyaloid cartilaginous substance, shaped by the grinding of the bone-ends upon each other.

The favorable results obtained from exsections of joints are really not due to the reproduction of articulating bone-ends as much as to the preservation of the insertions of the muscles or tendons. Exsections of the elbow joint give probably the best results among all the operations on joints. The reason for this is obvious, this joint being so superficial we have very easy access to it, and are generally enabled to remove the bones without interfering much with the soft tissues. Here we have the best possible chance to make a perfect subperiosteal operation, and neither extensor-, flexor-, pronator- nor supinator-muscles need to be severed. If the after-treatment is fairly conducted, and passive motions not neglected, we may have good reason to expect a movable joint with about as much usefulness as the original one. But with all it will only be a pseudarthrosis, or a false joint similar to the one formed by an ununited fracture.

As I have already stretched this paper longer than is wholesome for your patience, I must conclude without considering the result of such operations on any more joints; but I believe I have sufficiently demonstrated to you the fact that reproduction of a fac simile of the removed bone or joint is but very rarely, if ever, obtained, and that the healing process in the soft tissues is the result of a plastic inflammation.—*Southern California Practitioner.*

ARTICLE IV.

RECENT PROGRESS IN DENTISTRY.

BY WILLIAM HERBERT ROLLINS.

A.

*Altered Salivary Secretion.*¹

From each parotid duct there exuded a thick purulent fluid, which to the naked eye, as well as to microscopic examination, presented all the characters of "laudable" pus; the mouth was somewhat dry, and the whole mucous membrane had a curious reticulated look; the pus about the orifices of the ducts was free from odor and did not contain organisms, but the breath was unpleasant. The pus was strongly alkaline. The secretion began after an attack of typhoid fever and had existed for twenty years. The other oral secretions were normal. The patient's health was excellent, her digestion apparently perfect. The case is of great interest as showing that health can be maintained without parotid secretion, and while daily swallowing large amounts of pus.

*Epiphora and slight Ectropion cured by the extraction of a tooth.*²

There was a fistulous opening about half an inch before the inner canthus of the right eye, and well marked epiphora, as well as slight ectropion on that side. On an examination no canine could be found. An incision into the jaw over the position usually occupied by this tooth revealed the presence of a buried canine root. When this was extracted all the symptoms disappeared gradually.

1Tomes in Journ. Brit. Dent. Assn., p. 465.

2J. M. Ackland, in Journ. Brit. Dent. Assn., p. 467.

Calcification of the Tooth Pulps caused by Neuralgia of the Trigeminal Nerve.³

The patient had suffered with violent toothache for five months. Seven teeth had been extracted during this time without any relief. The extracted teeth were only slightly carious and had been filled. As the woman was only twenty, he did not consider that the new formations of dentine which was found in all the extracted teeth could have been physiological, as they might have been in an old person. Nor did the disease seem one originating in the teeth, for it extended to so many. In seeking for a cause elsewhere it was found that the trigeminal nerve was affected. The fontal, the supra, and infraorbital, and the zygomatic points were all very tender to pressure. The diagnosis was neuralgia of the second and third branches of the trigeminal nerve. The patient was anæmic, and of a family subjected to nervous diseases. The treatment, which was successful consisted of Fowler's solution, bromide of potash, and sulphate of iron. This case is interesting as these pulp ossifications are undoubtedly on the increase, and there is a tendency to consider them local in origin.

Necrosis of Alveolar Ridge after Measles.⁴

Three cases are reported, but the details are not given.

Crowded Arches the cause of Riggs' Disease.⁵

The writer considers that lateral compression is the predisposing cause of the wasting of the alveolar processes. The jaws are not large enough to allow the teeth to assume proper positions. He thinks that fungi are the intermediate cause of the inflammatory process.

Epilepsy from Dental Caries.⁶

Two cases are given in which the epileptic seizures disappeared immediately after the extraction of a carious tooth.

³ Spoffella in Brit. Journ. of Dent. Science, October, 1885.

⁴ Coterell in Brit. Journal of Dent. Science, p. 183, 1886.

⁵ Bate in South. Dent. Journ., p. 64, 1886.

⁶ Leibert in Brit. Journ. of Dent. Science. p. 116, 1886.

*Lagophthalmus due to Dental Irritation.*⁷

The left eyelid was so drawn up that the white showed above the iris. The second and third left molars were extracted because decayed. This relieved a persistent neuralgia with which the patient had suffered, but had no effect upon the eyelid. A year after it was decided to remove a filling in the left upper third molar. An exposure of the pulp was found. The tooth was extracted, and as a result the trouble in the eye gradually got well, having entirely disappeared in six months.

*Effect of Mental Overwork upon the Teeth.*⁸

Among the hard-worked pupils of the Paris public schools, the teeth become deteriorated in a few weeks after entry. The second dentition is often premature. These observations confirm the statements of Dr. J. L. Williams, who has given great attention to this subject. He has shown that any mental strain shows itself upon the teeth in a short time, both in increased decay, as well as in increased sensibility of the dentine. Dr. D. M. Parker has reported that these same changes are always apparent in men who are in training for athletic trials. As there is not the slightest doubt of the accuracy of these observations, they show that these are matters which demand serious consideration from educators.

*Spinal Irritation from the Teeth.*⁹

The patient, a girl of fourteen, had been under treatment for two years for reflex spinal irritation which was considered hysterical. An examination of the mouth showed that the bicuspid teeth were low down and wedged between the molars. The molars were extracted, and it was then found that the pulps were exposed. This exposure was thought to be due to absorption caused by the bicuspids. The patient recovered at once.

⁷ Dent. Cosmos, p. 123, 1886.

⁸ V. Gallippe in Brit. Journ. of Dent. Science, p. 995, 1885.

⁹ Redman in Brit. Journ. of Dent. Science, p. 715, 1885.

*Epistaxis caused by a Tooth.*¹⁰

There was severe hæmorrhage from the right nostril at intervals for several days. The upper right lateral was extracted; the blood flowed profusely from the nose but soon subsided and the bleeding did not return.

B.

*Alveolar Dental Membrane.*¹¹

This membrane consists of two distinct layers, developed from separate centres. The outer layer of fibrous connective tissue is the periosteum of the bone, the inner a layer of fine cells, originating in the dental follicle is the true root membrane.

*Is a Transplanted or Replanted Tooth Pulpless?*¹²

He relates two cases in which in regulating, it became necessary to rotate an upper lateral incisor. The ordinary means failing, the tooth was extracted and replaced in the proper position. These teeth have never discolored, and are as sensitive to heat and cold as the other teeth in the same mouth. This he thinks proves that the pulps are living.

Two similar cases have come under my observation in which perfectly healthy teeth in young persons having been entirely separated from the jaws by blows were replaced and to all appearance have healthy pulps; and when afterward they decayed, the dentine was sensitive.

*A new Method of Recording the movements of the Soft Palate.*¹³

A straight rod is passed through the nose from before backward, in the living subject. In this position it is not influenced by the movements of the soft palate; but if the end of the rod which remains without the nostril is raised

10 Johnston in Dental Cosmos, November, 1885.

11 Ingersol in South. Dent. Journ. p. 415, 1885.

12 Underwood in Brit. Journal of Dent. Science. p. 80, 1886.

13 Allen in Ohio State Journ. of Dent. Science. p. 551, 1885.

so that it comes in contact with the anterior border of the nostril, the pharyngeal end will lie in such a position as to receive a decided motion when the soft palate is raised. Supporting this rod from the forehead and recording its motions on carbonized paper gives a means of studying the motions of the soft palate in deglutition, respiration, coughing, hawking and snuffing, etc.

Progression in Teeth.

Human teeth have a tendency to move forward. This is seen clearly under several conditions. If a molar is extracted the teeth behind the gap move forward so that the space is almost entirely closed from this movement. If a tooth is extracted in regulating to make room and we wish to draw back the teeth in front of the gap, we shall find it necessary to have the frame from which the tension is exerted, extend around several teeth behind the space, for if the frame is attached to only one tooth on each side of the space the tooth behind will move forward much more than the other will move back. This is true even where the tooth behind the space is large and firmly implanted by means of three roots, as in a molar. The following case illustrates this: A canine tooth erupted behind the lateral incisor. There was much pain of a neuralgic character which I could account for only on the supposition that this tooth in some way acted as an irritant to the first bicuspid in which the pain was located. The bicuspid was therefore taken out and an attempt made to draw the canine back. A frame extending around all the three molars and second bicuspid was made and used as the fixed point from which tension on the canine was exerted, but the canine remained stationary while all the teeth behind began to move forward. It was found necessary to have a plate attached to all the available teeth in the mouth to prevent the teeth from moving forward before the canine moved back. This is an extreme case as the root of a canine is deeply implanted, but it serves to illustrate this tendency in teeth which I am certain exists. We see it plainly in some of the lower animals

as in the elephant, who has a constant progression of the molars whereby the masticating surfaces are kept constantly renewed.

C

Rapid Separators.

Numerous attempts have been made, from time to time, to produce an instrument for quickly separating the teeth, to prepare for filling. None of these attempts were successful. Recently, Dr. Bogue has devised a series of these instruments, which are of great value, as with them, enough space can be got in a few minutes to enable filling to be done without previous wedging, in the ordinary slow way.

Danger from small Artificial Plates.

Several cases of death from swallowing artificial plate, are mentioned in the journals for the past year. This shows how important it is to warn patients not to sleep with such appliances in their mouths.

An All-Porcelain Crown.¹⁴

The crown consists of a piece of ceramic body baked to the shape of the crown, which has been lost by decay. Wires projecting above the roots, into which they are firmly fixed, are the means of holding the crown in position, as they project into a hollow in the crown, being fastened there with cement.

A Band Matrix.¹⁵

The matrix consists of a narrow and thin band of steel of sufficient length to go three-quarters around a tooth. To use the matrix, it is bent around the tooth to be filled, and held in position by a small clamp, the ends of which go into holes in the ends of the band. By turning the screw in the clamp, the band is drawn tightly against the tooth, and held there.

Fractured Teeth.

The usual explanation of a fracture in a tooth, is to say

¹⁴ Howland in Ind. Pract. p. 187, 1886.

¹⁵ Guilford in Dent. Cosmos, p. 187, 1886.

that the tooth has received a blow. Redman¹⁶ reports a case in which there was no history of a blow, nor, indeed, had the tooth any antagonistic tooth, so that it seems impossible to consider the fracture traumatic. In this case, the first symptom was severe pain, which lasted for two days. Then the tooth became loose, and was found, by the dentist, to be split in halves lengthwise.

*An Impacted Tooth from a Fall.*¹⁷

The patient, falling from a horse, drove the right upper lateral into the jaw, so that it could not be seen from the front. The tooth was grasped with thin forceps, drawn into place, and held with splints for four days, when it was firm enough to do without further treatment.

*A new operation for Salivary Fistula.*¹⁸

The fistula, which was caused by a stab, opened on the cheek, and had no communication with the mouth. Two needles, threaded on one fairly-strong piece of silk, were successfully passed through the fistula into the mouth, piercing the buccal membrane one-quarter of an inch apart; the ends were firmly tied, inclosing a portion of the duct, and the surrounding tissues. The internal wound healed in a few weeks, and the saliva found its way into the mouth, as usual.

Accidents in Tooth Extraction.

At the December meeting of the Odont. Society of Great Britain, MacCormac related a case in which, during the extraction of a tooth, the forceps broke, and one blade disappeared. The patient immediately became "black" in the face, and almost suffocated. These symptoms gradually disappeared, and at the end of six weeks, there was no great cause for anxiety, though she suffered from pain on the right side of the sternum, spasmodic cough and bloody expectoration; so it was decided to open wind-pipe.

¹⁶ Brit. Journ. of Dental Science. p. 715, 1885.

¹⁷ Tomes in Brit. Jour. of Dental Science, January 15, 1886.

¹⁸ Hodgson in Dent. Cosmos, November 1885.

Though this, in opening the end, the broken blade could be felt, five inches below, in the right bronchus. The fragment was removed, the patient making a good recovery. As the forceps were made by Evrard, the most distinguished maker who has ever lived, there is no reason to think that they were not as perfect as possible. The case, therefore, shows the importance of guarding the throat in tooth extraction. A case occurring in my practice, shows one other danger, which has never been mentioned. In an attempt to extract an upper bicuspid, the forceps slipped, and closing just as it reach the lip, it took a piece of this between the blades and severed it entirely, thus leaving a permanent scar. As there is no use in having the blades of forceps with sharp-cutting edges, which come in contact, this very common form ought to be discarded.

Preparing for the Eruption of the First Permanent Molars.

These teeth usually erupt when a child is six years old. They almost always decay, either during eruption or shortly afterward. Until the eruption of the bicuspids, five years later, the anterior surfaces of these teeth are in contact with the first, or temporary molars. It is a well-established fact, that contact between teeth will result in decay in most mouths. As the temporary molars are only to remain in the mouth for a few years, there is no objection to so cutting away the posterior surfaces of these teeth, so as to give as small a contact as possible between them and the first permanent molars. A dentist should always see a child shortly after the age of five years, in order that this treatment may be carried out before the permanent teeth erupt, because after this, it is difficult to properly do the extensive cutting without injury to the permanent tooth, whose enamel is always soft at first. If it were possible to grind away the backs of the temporary molars, and thus prevent the permanent ones from ever touching them, the danger of decay would be slight, but there is a peculiar tendency in teeth, which has not been properly explained, or, so far as I am aware, noticed; this is the tendency which they show to

move toward the front of the mouth. I shall speak of this later, under the head of "Progression in Teeth." It is due to this tendency, that it is not practical, in most cases, to maintain perfectly free spaces in the positions named.

The best one can do, is to grind the backs of the temporary teeth at small points near the grinding surfaces, for here, contact will do the least harm: first because the enamel is strongest there; and second, because, if decay should begin, it can be more easily managed than at any other point on the approximal surfaces. Without a figure it is not easy to explain the shape this preventive trimming should make the teeth.

*Fatal Hemorrhage from Tooth Extraction.*¹⁹

Patient, aged twenty two, was admitted to the hospital for chronic synovitis of right knee, caused by a blow. Ten weeks after this, an aching lower molar was extracted. The bleeding ceased in a few minutes, but soon returned so perfuriously, that it was necessary to plug the socket. The bleeding continued, without interruption for seven days, when the patient died. Just before death, the temperature had risen to 102.6° F. All known styptics were tried. Stimulants were given at short intervals. As a similar case, in which transfusion was used, was given in my report in 1884, in which the patient recovered, after he had become practically dead, it seems worth while to speak of this again as this treatment did not seem to have occurred to the medical men who had this case in charge.—*Boston Med. and Surg. Journal.*

¹⁹ Albert, Dental Record. p. 85, 1886.

Editorial, Etc.

ON THE ROTATION METHOD—THE CONSTRUCTION OF THE FIRST GOLD LAYERS.*—As well understood, the construction of the first gold layers is quite hard work for a good many practitioners, especially when filling large cavities.

If the first layer of a filling, for instance, in approximal cavities in molars is not perfect, the whole filling is worthless.

Since November 1st, 1885, I experimented with all possible materials, for instance, tin foil, flannel, silk, spunk, rubber, etc., etc., to facilitate the construction of the first layer. Tin foil would be best, if it would not by its use take the adhering properties from the gold; still tin foil has got some very good properties, about which I will speak later on.

Purified cotton, I think, gives the best results. It must be thoroughly free of fat, and I think the preparation from C. Ash & Sons, the best one. The using of the cotton is very simple. After pressing a few slightly heated gold cylinders on the ground of the cavity, fill the same about one-half to two-thirds with cotton and press this one down with engine instruments, not too thick, for instance, No. 5. After removing the cotton again the gold has been pressed down around the floor and lower walls, equally and fitting as tight as possible.

When using cotton, a large quantity of gold should not be used for the forming of this first layer, less as when condensing directly with stone or steel instruments. Slightly heated gold pellets have then to be placed on this layer by the turning of hand instruments and then pressed down again in

*From William Herbst, Zahnarzt in Bremen.

Translated from the *Correspondenzblatt für Zahnärzte*, by Anton J. Hecker, Dental Student, University of Maryland.

the manner before described. After removing the cotton, the gold has to be condensed with stone or steel instruments and at last to be examined with the finest hand instruments if soft parts exist, which, if necessary have to be repaired with small pellets, so that the gold firmly attaches to the walls.

The advantages of this method are: 1st.—That the gold is perfectly tight on the base of the cavity. 2nd.—That the gold is equally pressed down and will not be any harder on the surface as on the base as it was pressed down without coming in direct contact with the instrument. The gold is hardened and pressed with rotating stone or steel instruments not before it lays perfectly tight in its place. The other layers can be treated with cotton or (as I described in my treatise) with stone or steel instruments.

THE AMERICAN DENTAL ASSOCIATION.—The Committee of Arrangements had hoped to give full and definite information in the July number of Journals in regard to all the details of the arrangements for the annual meeting of the Association to be held at Niagara Falls, August 3rd. But as the railroad rates thus far secured have not been as satisfactory as the Committee yet hope to secure and are working for, they will issue a circular later to all members of the Association and to local societies as far as possible. Those who are not members of the Association and who wish the circular will please drop a postal to the Chairman of the Committee to insure their getting it. The railroad rates as thus far secured on all leading lines are one and a third fare round trip to be issued upon presentation of certificate. Definite information concerning this will be given in the circular if better terms and arrangements are not secured. The hotel rates will be as follows: The International Hotel will receive dentists and their families at \$3.00 per day; the Cataract at \$4.00; the Niagara, Prospect Park and Hotel Atlantique \$2.00 per day if rooms are applied for and secured in advance. The Park Theatre, adjoining the International Hotel has been secured as the place of meeting. Do not be anxious about not receiving the circular; you will

get it sometime in July, but a few days delay in issuing the circular may mean a good deal of money saved to those attending the Association. For instance, the arrangements were not completed and circular issued until latter part of July last year. A month earlier it would have been *impossible* to have gotten the low rates finally secured. Remember, we *promise* nothing better than we now publish but will continue to work for more favorable terms.

All State and local Societies which have adopted substantially the Code of Ethics of the American Dental Association, will remember that they are entitled to one delegate for every five members. Such delegates must have credentials signed by the President and Secretary of the Society which they represent.

J. N. CROUSE,

Chairman of Committee of Arrangements,
2231 Prairie Avenue, Chicago, Ill.

THE GEORGIA STATE DENTAL BOARD.—“*University of Maryland, Faculty of Physic, Department of Dental Surgery, Baltimore, May 20th, 1886.*—The Secretary of the Georgia State Board of Dental Examiners, Dr. L. D. Carpenter, of Atlanta, Georgia, having submitted the questions on Therapeutics, Operative Dentistry, Pathology, Physiology, Anatomy, Chemistry, Materia Medica, Prosthetic Dentistry and Metallurgy, which were presented to the applicants for license to practice dentistry in the State of Georgia at the recent examination held by the State Board of Dental Examiners, to the undersigned, members of the Faculty of the *Dental Department of the University of Maryland*, for their opinion of said questions, we desire to state that we have carefully examined the same, and consider them to be well-selected, fair and equitable, and such as all graduates of dental schools, and more especially recent graduates, should be able to answer satisfactorily and successfully.

Ferdinand J. S. Gorgas, M. D., D. D. S.,
Professor of Principles of Dental Science, Dental Surgery, Dental Prosthesis and Dental Materia Medica.

James H. Harris, M. D., D. D. S.,
Professor of Operative and Clinical Dentistry.

Francis T. Miles, M. D.,
Professor of Physiology.

J. Edwin Michael, M. D.,
Professor of Anatomy.

R. Dorsey Coale,
Professor of Chemistry and Metallurgy.

Monthly Summary.

SOMETHING NEW IN MAKING RUBBER PLATES.—One of the features introduced as a novelty, at the late meeting of the Mad River Valley Dental Society, was a method of making vulcanite plates without the teeth attached; in other words, vulcanizing the rubber on the plaster model, using the plate or plates thus obtained instead of a wax base-plate for securing a bite, and finally attaching the teeth by a second process of vulcanizing. The idea is original, we believe, with Dr. Bradley, of Dayton, O. The advantages claimed for the method are such as apply to swaged metallic plates, viz.: greater accuracy in securing a "bite," in difficult cases, the opportunity of determining at an early stage of the operation whether a good fit has been secured, also the advantage of allowing the patient to wear and accustom himself to the plate before the teeth are attached. Dr. Bradley thinks the method of special advantage in all partial lower cases. The narrow rubber band at the lingual base of lower anterior teeth may be strengthened by cutting a groove with a fissure or wheel-bur, fitting into this a *brass* wire, and vulcanizing rubber over it. For attaching the teeth, the surface of the plate is treated with a solution of persulphide of carbon, after which, the teeth being in position, more rubber is applied, and the piece again vulcanized.

Dr. Adams, of Dayton, stated to the Society that the packing of the rubber, when the plate is first made may be done as ordinarily, with the fingers and a blunt burnisher, after which the surface is covered with tin foil, the case invested and vulcanized. He dispenses with the wax base-plate, and consequently with the various steps of varnishing and oiling, and a second pouring of plaster in the flask. To be more ex-

plait, the rubber strips are packed upon the face of the model *before* flasking at all, and then the model is invested at one operation and immediately vulcanized. It will be seen from this, that no pressure is brought to bear upon the rubber in closing the flask. Plates made in this way were exhibited to the Society. They appeared to be quite as hard, tough, and strong as any made in the usual way, giving no evidence of porosity.

A member stated that Dr. Haskell vulcanizes only thirty minutes, being careful that the flasks are steam-tight and kept covered with water.

Dr. A. Berry said he had not succeeded in the attempt to vulcanize in that time. He also stated that rubber packed without forcible pressure makes a stronger plate than when the rubber is powerfully compressed in the flask.—*Cinn. Med. and Dental Journal*.

CARIES OF LEFT SIDE INFERIOR MAXILLA.—Dr. B. H. Catching, D. D. S., before the Georgia Dental Society, said: This case, a very serious one, may prove of interest to the profession. A Sister of Mercy was suffering, as she supposed, from odontalgia in a lower left molar. She visited a dentist, who extracted, as he supposed, the offender, without giving relief. She returned to the same dentist, a short time afterwards, complaining of jaw-ache. Another molar was removed, without affording relief. A few months after, intense suffering, causing complete prostration, ensued. An abscess about the size of a tea-cup, formed at the angle of the jaw, involving the submaxillary gland of that side. This produced occlusion of the jaws.

Dr. F. H. O'Brien, an eminent physician, was called. The trouble, he saw at a glance, was a very serious one. He lanced the abscess, evacuating about a tea-cup of pus, so offensive that no one could remain in the room until it was deodorized. He became satisfied that it was a case requiring the care of a dental surgeon, and called the writer in. He had previously told the Sister that in all probability a part of her jaw would have to be removed. When I first visited her, in company with

Dr. O'Brien, I found her in a very despondent mood, with hardly enough vitality to take interest in our visit. Pyæmia was evidently manifesting itself. Her jaws were so occluded that I could not make an oral examination. The abscess was ordered washed out repeatedly by injecting with carbolated water, and instructions given that she endeavor to move her jaws frequently during the next twenty-four hours. On the next day I still found the occlusion so great as to prevent an examination. She was urged to repeated trials of separation. After the fifth day I could introduce my finger, with which I discovered a molar, very loose, remaining. With some difficulty it was removed, when with a probe the honeycomb surface was revealed, showing beyond doubt, in connection with the nature of the discharge, caries of the bone.

A few days later, when I had better access to the parts, and when the patient was able to undergo the operation, I laid the gum open from the ramus to the second bicuspid, and pressed it away on either side, which was easily done, as the adhesion to the bone was very imperfect. With a good sized scraper the diseased surface of the bone was removed. Aromatic sulphuric acid diluted was applied on cotton to the whole diseased surface. While I was treating locally, Dr. O'Brien was successfully treating systemically. After about three months, she was entirely cured.—*Southern Dental Journal*.

ARSENIC IN KILLING PULPS OF TEETH.—Arsenic will seldom produce pain if applied without morphia, and with tannin. Even if the tooth is aching at the time of its application, it will generally soothe it to death. It is sometimes desirable to precede its application with a little cotton saturated with chloroform. Morphia is an extreme irritant to a raw surface—try it on a wound or burn—and therefore instead of abating toothache caused by an exposed pulp, it increases it. The cause of pain in such a pulp is inflammation, which is not an increased flow of blood to a part, as generally supposed, but a clogging of the venous blood of a part, so that the blood cannot return through the veins with the normal freedom it is brought to the part. Tannin constricts the pulp, so that instead of

the nerves being pressed by the swelling of the mass within confining walls, the whole becomes tanned and shrunk. Pain everywhere in the body is caused by pressure on the nerves, especially on their termini.

A good combination of the arsenic is: One part by weight of arsenic and two of tannin, to be made into a thin paste by one part oil of cloves and two parts creosote. The finer the arsenic is pulverized the less is required to do the work; in fact, but an extremely small amount of the paste should be applied. Twenty-four hours is generally sufficient to devitalize the pulp; though when this very small amount is used there is little danger in its remaining longer, and generally the pulp will be found sufficiently tanned to be brought away whole. Sometimes the paste has to be applied a second time. After touching the pulp with this paste loosely, filling the cavity with cotton, and then on this drop a little sandarac varnish. Any filling which necessitates pressure on the pulp will, of course, produce pain.—*Items of Interest.*

TUBERCULOSIS OF THE BUCCAL MUCOUS MEMBRANE.—

There are four different ulcerations which may attack the buccal mucous membrane. All four are of a grave nature, but one, if early recognized and correctly treated, may be cured, provided it has not yet impregnated the whole system. These four are carcinoma, lupus, syphilis, and tuberculosis. Mr. David Hauseman, of Kiel (*Virchow's Arch.*, 103 bd., 2 heft, 1886), has recently drawn our attention to these ulcerations, and published the result of his investigations.

According to him, the main point, the correct diagnosis, can only be made by excision of the new growth and later examination of the same under the microscope. For this purpose, while the presence of giant cells with granulation tissue might answer in a general way, the discovery of the tubercle bacilli forms alone the definite proof, but of late it has been made so easy to detect their presence that almost a tyro in the art, provided his microscope be powerful enough, can demonstrate their existence. The tubercular nature proved, a thorough excision will establish a radical cure, provided the system

is not yet affected, *i. e.*, provided there is no dullness over the apex of one lung.

Lupus can generally be excluded by noticing for one or two weeks the effect of specific treatment, as under the latter any syphilitic sore would at once improve. While the diagnosis between cancer and lupus is easy, that between the latter and tuberculosis is more difficult, as the bacillus of lupus and that of tubercle greatly resemble each other. Here the pure-culture, or at least the color-test will decide.

The advantages to be obtained from following H's advice is clear, as an early excision of the tubercular growth will prevent a return and a general infection, while of the other malignant growths such cannot be said with the same certainty.—*Med. and Surg. Reporter.*

INTIMACY BREEDS CONTEMPT.—The relation of dentist and patient—as it is with physician and patient—is so close that nothing but a dignified reserve can prevent an intimacy which breeds contempt. Because patients come to us for professional work is no reason we should expect to become their friend and acquaintance and yet many dentists, before they have completed their professional engagements, seem to think they must pry into all the private affairs of their patients—their failures and successes in business, their likes and dislikes in society, and even their more private concerns. If their patient is of the gentler sex, this intimacy too often includes a maudlin sentimentality and repulsive improprieties. It is astonishing such dentists are tolerated with in any society. They certainly lose the respect of their best patrons. Intimacy breeds contempt.—*Items of Interest.*

A REMARKABLE CASE.—Mrs. F. A. Lewis died at her residence in this place on Friday morning last, aged about sixty years. Mrs. Lewis for many months past has suffered intensely from an affliction which completely baffled the skill of the physicians of this city, who have assiduously waited

upon her, as well as physicians elsewhere, whom she had consulted. Such was the singular character of the malady that no surgical operation suggested itself for her relief. Some days before her death she asked that a post-mortem examination should be made in the interest of science, and that afternoon the same was made by Dr. Martin, assisted by Drs. Roy and Ashton, when a tuft of hair was discovered inside of her as large as a man's fist. The physicians say that no such case is recorded in the medical works, and has not occurred in their experience. Mrs. Lewis has resided in this place almost continuously since her return from California, in 1851, when she was a passenger on the ill-fated steamer *Central America*, which was lost at sea, when her gallant captain, Wm. Lewis Herndon, a native of this city, and a number of the crew and passengers went down with the ship. Mrs. Lewis, upon leaving the ship, received from Capt. Herndon his watch, with the request that if saved she would deliver the same to Mrs. Herndon, then residing in New York city, which trust was faithfully fulfilled.—*Fredericksburg (Va) News*.

THE TREATMENT OF SICK HEADACHE.—Dr. W. Gill Wylie (*N. Y. Med. Jour.*) of New York, has produced excellent results with the following treatment: So soon as the first pain is felt, the patient is to take a pill or capsule containing one grain of inspissated ox gall and one drop of oil of gaultheria, every hour until relief is felt, or until six have been taken. Dr. Wylie states that sick headache, as such, is almost invariably cut short by this plan, although some pain of a neuralgic character remains in a few cases.

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ARTICLE I.

RECENT PROGRESS IN DENTISTRY.

BY WILLIAM HERBERT ROLLINS.

*Danger of Pulpitis from the use of Gutta-percha as a Pulp
Capping.¹*

The writer claims that this material expands so much, that when used over a pulp, under a metal filling, it creates enough pressure to kill the pulp.

Cystic Tumor of the Alveolar Membrane.²

The patient had been treated by one physician for gout, by another, for an obscure liver disease, but in each case, without relief to the symptoms, which were intense pain over the face, scalp, and occiput, extending down the spine as far as the last ribs; and upon the neck, as far as the bifurcation of the two heads of the origin of the sterno-

¹ Brit. Jour. of Dental Science, October, 1885.

² Harris in Brit. Jour. of Dental Science, p. 894, 1885.

mastoid muscle. The pain was worse at night, and about half an hour after meals, at which latter time the stomach became tympanitic, impeding the movements of the diaphragm to such an extent as to cause alarming dyspnoea. An examination of the mouth showed nothing abnormal in its appearance. On a more extended examination, the resistance offered by a first upper molar to pressure, was found to be slightly different from that of the other teeth. On this slight hint, the tooth was extracted. Attached to the root, was found a hard, slightly vascular tumor with three lobes, which projected into the antrum. As the result of the extraction, all the symptoms disappeared.

Loss of Sensation in the Gums and Lips after Tooth Extraction.⁸

The patient, a surgeon, in the course of five years, had three teeth extracted, following which, in each case, there had been loss of sensation in the gums and lips, from the angle of the jaw forward to the median line. Sensation gradually returned without treatment, and was fully re-established in three months.

Chronic Ptyalorrhœa of the Glands of the Oral Mucosa.

This disease has not been clearly recognized, though to the effects which it produces upon the teeth several names have been given, beginning with John Hunter, who mistook one of its symptoms for a distinct disease to which he gave the name "decay by denudation." This name is still in use, and other and more recent writers have farther withdrawn attention from the real disease by giving the names "surface wear," "erosion," "denuding," "chemical abrasion," to its effects upon the teeth.

The only treatment which the writers who have used these names have suggested, has been either to do nothing, or, when the effects upon the teeth have been extensive to fill the cavities with gold.

⁸ Glassington in Dental Record, p. 192, 1886.

Ptyalorrhœa shows itself in an increase in the amount of the secretion of the acinous glands of the lips and cheeks. Accompanying this increase in amount is an increased viscosity and slight acidity. Even in those cases where the effect upon the teeth is very rapid there is seldom a marked acid reaction in the secretion. This faint acidity explains why the grooves in the teeth almost always are smooth, as if polished; indeed, many writers mistaking the real cause of the trouble, have attributed the grooving of the teeth to the effects of a stiff brush in cleaning them.

There are cases where caries supplements ptyalorrhœa in which the starting point of the caries is due to the intensity of the ptyalorrhœa, the evidently softened tooth substance not being removed as rapidly as formed; thus affording a culture ground for germs which produce the usual results, caries. These cases are chiefly those of the channeled form, in which the effects upon the teeth consist of grooves across the teeth near the necks.

Ptyalorrhœa is an entirely distinct disease from caries. In most cases it is a local expression of some ill-defined constitutional condition or conditions. In a less number of cases it is sharply local. Its effects upon the teeth show themselves in at least three forms. In a general wasting away of the teeth; in transverse channeling of the teeth at their necks; by the formation of saucer-shaped cavities upon the labial surfaces of the teeth. This last form attacks the canine teeth often before any others. This fact, together with another, that pulpless teeth are as much affected as those having living pulps, tend to show that the effects upon the teeth are not due, as has been suggested, to a retrograde metamorphosis in which the wasting of the teeth is produced by an absorption of the lime salts by a new cellular growth. In one of these cases there is no living tissue from which the cells could come, while on the other hand it is not likely that if this were the true explanation the canine tooth which is the strongest tooth would be attacked first. In the cases in which the cupped or saucer

shaped cavities are formed on prominent portions of the labial surfaces it is often easy to see the effect of the glandular congestion: the orifices on the mucous membrane occupying the centres of little raised papillæ of a deep red color. If the surface of the membrane is dried, only a few seconds will elapse before it is studded with little pearls of secretion, acid to litmus paper. In an ordinary condition of these glands a minute or more would elapse before any secretion would be observed, nor would the reaction ever be acid except early in the morning. It is an open question whether the action of the parotid secretion and also that of these glands may not be normally acid for a short time before rising; whether this transient acidity is due to the same acid or acids that are present in the pathological conditions named is not known. Treatment where the disease is simply a local manifestation of an undetermined constitutional condition, we can give alkalies as these at least diminish the local effects upon the teeth, though this treatment may be only palliative.

In those cases where the disease is evidently due to an overworked condition of the patient, as is frequently the case in nervous children, these alkalies are of great value, as they improve the condition of the digestion. A large number of cases of ptyalorrhœa of this kind have been cured in a few months by this treatment. In other cases where gout is responsible for the trouble this treatment is also of value.

Local Treatment. This should consist of the daily use of astringent and alkaline mouth washes. Where the disease is evidently local and confined to a few glands these may be partly broken up by tattooing; or the use of electrolysis may be suggested.

Fungi found in the Human Mouth.

Miller⁴ has found twenty-two fungi in the human mouth. Ten of these are micro- or diplo-cocci. Five are

⁴ In Ind. Pract., p. 298, 1885.

bacteria, and six are bacilli. In liquid media three develop into leptotrix, one into spirilli; eight are motile, while only three have been seen to form spores; the others multiplying only by division. Ten are strictly ærobian, and eight grow equally well without air. Sixteen produce an acid reaction in beef extract and in sugar; four produce alkaline reaction. In all cases where the acid produced was tested it was found to be lactic acid. His conclusions are, that a great majority of the fungi found in the human mouth are capable of producing acid from cane or grape sugar but in non-fermentable substances the reaction produced is alkaline. In those cases where the fungus produces both an acid and an alkaline reaction there are two processes going on, first the nutrition of the organism accompanied with an alkaline reaction; second, the fermentive action accompanied by acid products. A large number of these fungi possess a peptonizing action which accounts for the solution of the dentine after it has been decalcified.

Any of these fungi that can produce acid by fermentation of carbo-hydrates, or can dissolve the decalcified dentine may aid in the production of caries, while only those which combine both of these properties, can produce the disease. A solution of dentine or enamel without previous decalcification cannot take place. The comparative or complete independence of air of many of these germs explains why caries can go on under fillings or deep in the cavity of a tooth. The fact that teeth form such poor culture substrata for schizomycetes is an additional proof of the position that they are not the primary cause of caries which is produced by acid resulting from the action of these organisms on certain carbo hydrates in the mouth.

D

*Nitrous Oxide Dangerous.*⁵

Nitrous oxide should never be given pure, as, though it may not produce death, there are many concomitant ac-

⁵ Lafont in South. Dent. Jour. page 75, 1886.

cidents. Among those mentioned are, first, death of the foetus in a young woman enciente five months, who had taken the gas to have a tooth extracted. Second, several cases of albuminuria. Third, numerous cases of suppression of the menses.

*Alkalies for Sensitiveness of the Teeth.*⁶

If bicarbonate of potash is given in doses of five grains three times a day the sensibility of the teeth in excavating them is much diminished.

Iodol.

Among the new antiseptics, this drug has been useful in treating dead pulps and as an injection in Rigg's disease.

*Napelline in Acute Pulpitis.*⁷

Napelline was given in granules of one-twelfth of a grain, repeated every fifteen minutes. In each of the cases the pain ceased after five or six dozes had been given.

Naphthol.

B. naphthol is superior to carbolic acid or creosote as an injection into the sac of an alveolar abscess, and as a dressing for suppurating pulps. Its comparative freedom from odor and the absence of unpleasant after-effects if it comes in contact with the gums or lips are strong points in its favor.

*Amalgam Fillings.*⁸

Fletcher says mercurial poisoning may occur where a plug is made with the grossest carelessness and an immense amount of uncombined mercury, though he has never seen a case in twenty years practice. But this, even if it does occur is a proof not that amalgam is in fault but that the dentist is not acquainted with the material he is using. Any dentist who will put in a filling saturated with uncom-

⁶ Abbot in Dental Pract. page 54, 1886.

⁷ Grognot in South. Dent. Journ., p. 388, 1885.

⁸ In Am Journ. Dent. Science.

bined mercury had better discontinue practice till his education is more complete.

*Ambrosia Artemesæfolia as a Hæmostatic.*⁹

Several cases are given in which a decoction of the fresh leaves used locally and taken internally stopped the bleeding when other remedies had failed. No exact directions are given.

*Pilocarpin in Toothache.*¹⁰

A solution of two grains of the drug in one ounce of water was used. This was injected into the temporal region on the side of the neuralgia from the teeth. In one case a quarter of a grain was used, in two others one-eighth of a grain.

In all the cases the pain disappeared in about an hour after the injection.

*Arsenical Treatment of the Tooth Pulp.*¹¹

The usual length of time that arsenic has been allowed to remain in contact with the tooth has been a few hours only. Then, if as usually happened, the pulp was not dead, the application was renewed as many times as was necessary to produce this result. Morsman thinks the arsenic should remain in contact with the tooth until the pulp is killed even if it takes a month. He claims there is no danger in this, as the arsenic is never absorbed.

⁹ Hill in Ohio State Journ. of Dent. Science, p. 479, 1885.

¹⁰ Kuszakoff in Dent. Register page 150, 1886.

¹¹ Morsman in Am. Journ. of Dental Science page 453, 1886.

ARTICLE II.

POCKET DISEASE OF THE ALVEOLUS.

BY J. N. FARRAR, M. D., D. D. S., NEW YORK CITY.

As injurious as the malady termed alveolar abscess may be to the usefulness of the teeth, there is a disease of the socket known as "*Pyorrhœa Alveolaris*," which in its consequences is more detrimental.

A disease belonging to middle and later life, it attacks at all ages after childhood. Although seldom found as early as at ten years of age, it is not infrequent at twenty, very common at forty, and (in some countries) almost universal at sixty.

The chief characteristic of this lesion, which in its unchecked course passes from bad to worse through several successive stages, is separation of the lining membrane of the socket (scientifically denominated *pericementum*) from portions of the root of the tooth, thus causing a pouch or pocket between the two, with a mouth at the margin of the gum.

Deferring for the present the aspect of constitutional tendencies, this pocket appears to the naked eye to have its initiation in inflammation of the annular lip, known as the "gingival margin" of the gum, which in its normal condition generally constitutes a shallow trough around the neck of a tooth. From whatever this inflammation arises, the ring-like lip swells, causing more or less pouching, so that irritating matter of different sorts easily collects in the trough, which increasingly aggravates the trouble.

Often, if not generally in these cases, more or less pus discharges at the necks of the teeth. In some cases this pus is creamy in appearance, in others watery, and in quantity it varies from that which is invisible to a drop or two. As a rule, a visible quantity of creamy pus indicates the

presence of large quantities of soft, degenerated deposits in the pocket, or rough, sharp incrustations of earthy matter upon the root, while a watery discharge is an evidence that the deposit is scanty in quantity, or comparatively smooth. Cases belonging to the latter class are generally more or less chronic.

After this disease has become passive it requires but slight irritation to keep it along. In fact, nothing more seems necessary than the alteration of the juices that ooze from the blood through the walls into the pocket, which soon becomes rancid, and made worse by microbes, which are generally, if not always, present. These are the cases which are sometimes cited as proof that this disease may arise independently of local irritations. But upon this point more is intended at another time.

While entire sockets are occasionally affected, most of them are attacked only on one or two sides, ranging from a slight distance from within the annular lip to the entire length of the root.

Differentiately speaking, one of these diseases kindles comparatively sudden, and is generally violent in development; the other is slow and insidious. One begins in the interior of the jaw, around about the end of the root, in the form of a tumor, and generally results in an abscess; the other starts on the exterior, just within the gingival margin of the gum, and by a sort of ulcerative process works down between the lining membrane of the socket and the root. (Never "beginning about the end of the root," nor is the cause the "same in kind as that which leads to exostosis or enlargement of the root.") One seems to make an effort to rid the part of an evil irritant by delivering it from within outwardly, generally through the side of the socket, as if attempting to do as little harm to the tooth as possible; the other from without inwardly, as if bent on doing all the mischief possible, first to the socket by the "wasting process," second by the loosening and final ejection of the tooth, soon after which the disease generally vanishes. In

short, one seems to act on the defensive, the other on the offensive.

Those rare cases of so-called alveolar abscesses which are said to form on the side of the roots of teeth having living pulps, where there are no pockets opening at the cervical margins of the gums, are not of this variety of socket disease. There are, however, two conditions of abscess that are the result of detached sharp fragments of calcareous deposits from the roots caused by this disease, or in later stages of the pocket disease, after having effected a carious condition of the alveolar process, which, although bodily not dead tissue, yet from decomposition of minute particles here and there, or from stasis in the soft tissues in the rear of the walls of the pocket, evolve gas, etc., and cause tumefaction outside of the alveolar process at greater or less distance from the pocket, but as these must be considered more in the light of "sequelæ" they do not strictly belong to the present aspect of the question, hence will not be further dwelt upon at this time.

In order to prepare your mind, I will anticipate some features of my story by briefly stating that it has been taught, and the notion appears to be generally believed, that there is always necrosis of some portion of the alveolar process in these cases, and that without it a true type of the disease does not exist, and based upon this, excision of the hard tissue has become almost a universal treatment.

Although sometimes present in later stages of the disease, I am led to believe, from careful investigation and treatment upon an average of about fifty teeth per day for several years, that this disease must really exist long before the alveolus can possibly become carious, a condition which in some form, must precede necrosis. Furthermore, I think that although more frequently present among that portion of the lower orders of society which do not get their teeth extracted whenever slightly annoying, caries and necrosis exist only in a small percentage of cases. Especially so among the middle and upper classes, who are more in the habit of caring for their teeth.

At this time this statement may seem like heresy, but it is based upon careful records of every case in my practice for ten years, which show that only about one per cent. of the patients (not the number of teeth) was afflicted with necrosis of the alveolus, the proof of which laid in the cure without surgically interfering with the alveolar process. The same evidence exists in the *almost* universally rapid cure after extraction, which would not be so if necrotic tissue remained.

Although my own practice shows only one per cent., I do not pretend that the experience of others must be the same; but supposing that others should find double the percentage, it would not materially change the basis of the conclusions. Although necrosis of the alveolar process is rare, the death and degeneracy of that portion of the cementum constituting one of the walls of the pockets is not uncommon.

While this disease is as old as civilization, it received but little attention from the profession until a few years ago, and until of late was supposed to be incurable except by extraction of the tooth; but it is now known to be otherwise, notwithstanding it is pretended that all treatment is as yet empirical, on the ground that the etiology of the disease is not fully understood.

In such a state of things, as with all questions in dispute, various hypotheses and notions abound, some of which seem reasonable, others amusingly absurd, making it appear that all are groping in the shades of uncertainty.

Even the matter of a name for the disease is unsettled. While some people say that one name is as proper as another, and think that Tom Jones is a name for his characteristics, others think that in order to be as scientific and practicable as possible the characteristics of a disease should in a measure be expressed in the derivatives of the same. The term *Pyorrhœa* (pus flowing), although satisfactory to some people, with others is not; and although I am averse to innovations in nomenclature once accepted by any con-

siderable number of people, I must say that with the dissatisfied I incline, for several reasons. 1st, the lesion does not always flow pus; 2d, it fails to express any idea of the chief and constant characteristic of the lesion (pocket); and, 3d, it fails to carry in its meaning sufficient diagnostic value to differentiate the disease from the other pus-flowing socket (whitlowic alveolar abscess), which also discharges at the neck of the tooth.

If what has been said be true, that the disease, so far as can be seen by the naked eye, commences about the neck of the tooth, and extends down the socket-causing pockets, and if true that pus is caused by irritation from deposits within, and the disease vanishes when the pockets are carefully and thoroughly cleaned, and *kept clean*, or when the teeth are extracted, and the main conditions of the lesion differ from that of a whitlowic condition of alveolar abscess, and if alveolar caries or necrosis, if present at all, belongs to later stages of the disease, and is a result rather than a cause, then the suggestion naturally presents itself: Ought not the general name to be fixed upon the most pronounced constant feature?

Supposing it were possible to find a term that would by some modification differentiate the two kinds of "pus flowing," would it be best to confine the meaning to simply the act of flowing of pus, when it is well known that the act in a large percentage of cases is not visible? Admitting this, for sake of the argument, would it be much better to confine its meaning to any one of the stages, which, if present at all, would, by its transitional acts, soon lose identity? Even if comparatively stationary, would it be well to fix upon stage conditions, such as when the surfaces of the walls of the pocket have become pyogenic, or when the alveolar process has become carious, or perhaps necrotic, when we know that any one, or all, may possibly be wanting? On the other hand, if the lesion has a peculiar characteristic in the pouch or pocket formation, and this is the only constant characteristic feature of the lesion, does it not

have the strongest claim to the name? It seems so to me, and for that reason I generally use the term in preference to Magitot's.

While I generally prefer to use the English language in expressing the name, I sometimes use the Latin equivalent, Marsupiosis (pouch disease), or Loculosis (pocket disease), adding Alveolaris, which, rendered in full, is Marsupiosis Alveolaris, and Loculosis Alveolaris (pocket disease of the alveolus). Of the two terms, the latter probably would generally be considered the more euphonious.*

To distinguish one phase of the disease from another, characteristic expressions, or numerals in the natural order of the successive stages, may be used. Thus, inflammation of the gingival margin of the gum (gingivitis) may be known as the first stage, while a later one, when the pocket has become established, may be known as the second, the carious as the third, and the necrotic as the fourth stage.

When, in order to be explicit, it is desirable to express the recurrent form of this disease (after once cured), which is liable in cases where death or low vitality of the cemental wall of the pocket prevents reunion with the pericemental wall, the termination *osis* may be changed to *itis*, thus: Loculitis (disease of the pocket), which easily distinguishes it from the original pocket disease.

Another modification may be convenient—the changing of the terminations above mentioned to *ic*—thus, Locu-

*Loc (us)—a place.

(ul)—diminutive suffix.

Locul (us)—a little place, or hole; a fold in the "toga," used as pocket.

os (is)—a Greek termination denoting the becoming, or the change to a certain state; as, necrosis, "the becoming dead."

Loculosis—the formation of, or "becoming," a pocket; or a disease which consists in the formation of a pocket.

Alveolaris—pertaining to, or situated in, the alveolus.

Loculosis Alveolaris=pocket disease located in the alveolus. Pocket disease of the alveolus.

litic (as in the expression, "The sockets are in a loculitic condition.")

To reiterate, these brief, explicit and easily-spoken terms in a nut-shell, are as follows:

Loculosis Alveolaris—Pocket disease of the Alveolus.

Loculitis—Disease of the pockets (recurrent form).

Loculitic—In the pocket disease condition.

First stage—Gingivitis.

Second stage—Pocket established.

Third stage—Carious condition of the alveolar process.

Fourth stage—Necrotic condition of the alveolar process.

ARTICLE III.

A VISIT TO FOREIGN DENTAL SCHOOLS AND OTHER OBSERVATIONS.

BY A. W. HARLAN, M. D., D. D. S., CHICAGO, ILLINOIS.

A recent visit to Europe enabled me to observe the workings of the dental schools of London, Berlin and Paris. Before describing what I saw and heard in London, a few preliminary remarks concerning requirements for admission to English dental hospitals may be useful. Applicants for entrance to British dental schools, who commenced the study of dentistry prior to 1878, are not required to pass the entrance examinations; all others must undergo a preliminary entrance examination, comprising English language, grammar and composition, English history, modern geography, Latin, including grammar and translation, elements of mathematics, vulgar and decimal fractions, algebra (simple equations), geometry, including the first two books

of Euclid, elementary mechanics of solids and fluids, including statics, dynamics and hydrostatics, and one of the following optional subjects: Greek, French, German, Italian or other modern language, logic, botany or elementary chemistry.

When the student has fulfilled the above requirements he is required to register himself as a dental student at the office of the General Medical Council. After such registration he must pursue his studies for four years in one of the recognized schools, including in that period an apprenticeship in mechanical dentistry under some registered dentist. Before taking his final examination for the L. D. S. degree, he must attain the age of twenty-one years. During the four years of studentship he attends lectures on general anatomy, pathology, chemistry, surgery, materia medica, physiology, and other general medical and scientific subjects in a regular medical school. He also does his dissecting, chemical and histological work, including the work of dresser or assistant in a hospital ward in the same school. Dental anatomy, physiology, surgery, mechanical and operative dentistry, special therapeutics, anæsthesia and other special subjects, are taught in the dental hospital, including practical work in operative dentistry.

Instructions in mechanical dentistry, as before mentioned, is obtained from private sources. The theory of mechanical dentistry, including carving of bone, ivory, etc., manufacture of instruments, swaging, soldering, and the putting up of specimen cases, is taught in the dental hospital. Practical cases are not made in the dental schools of London. (I was so informed.)

On entering the Dental Hospital of London, (founded 1859), situated on one side of Leicester Square, you at first find yourself in the reception room for patients (which is open daily, except Sundays, from 9 to 11 A. M.) A clerk or book-keeper records the age, sex, residence, occupation and other facts of this nature relating to the patient, including the kind of operation which is required for his relief,

(filling, extracting, correction of irregularity, cleansing teeth, surgical operation, or other required service.) The patient then goes up stairs, where he is received by the house surgeon or his assistant, by whom he is assigned to the student. There are always plenty of patients. If an anæsthetic is to be administered it is given by the regularly appointed anæsthetist of the school, or under his direction. He attends daily. At least one clinical instructor is present daily, who performs some operation in filling or otherwise, during his hours of service. The house surgeon and his assistant have charge of the operating rooms, and furnish the materials for filling, etc., to the student, who collects the fee. When the student gets a sheet of gold (No. 4) he pays thirty-six cents for it, and of course gets as much or more from the patient. No charges are made for plastic fillings, tin, gutta-percha, or other services, except for gold, as above stated. This has a tendency to discourage the use of gold by the patient. He prefers the filling which costs nothing. The student, in consequence, does not get from this method of fees as much practical use of gold, even in twice the length of time, as he obtains in an American dental college. From what I saw I should say that very little cohesive gold is used by students in the hospital. Certainly not many large and complicated gold fillings are made by them during the two years' clinical work. They obtain a knowledge of the use of non-cohesive gold, however, which is perhaps quite as valuable in practice, because the English dentists as a class (with few exceptions) do not make, or attempt to make, large gold fillings, preferring plastics, pivoting or extraction, when cavities are large or teeth are pulpless: as they argue, from the system of fees which are in vogue, that it does not pay the operator; that people will not submit to prolonged operations, and that in many cases large gold fillings will not prove as serviceable (through lack of care of the teeth after filling, etc.) as frequently-renewed plastic fillings.

Root filling is taught, but I fear many (at present) do

not practice it with that degree of care and thoroughness which we deem essential to success. It is not considered good practice in America, I believe, to fill roots of teeth with cotton, or to leave them unfilled and drill a vent-hole in the side of the root. Many dentists in Great Britain and on the continent practice in this way daily. American methods of filling teeth, and roots of teeth, have not taken that deep hold on the European practitioner which some theorists would gladly have one believe. Many foreign dentists—like some at home—read nearly everything that is published, but do not put into practice what in many cases would be better for their clients. They are content with the knowledge they possess, and do not easily or readily take up with new ideas. They are too conservative.

The rubber dam is used in the hospital. The gentlemanly house surgeon explained the methods of teaching, and was at considerable pains to show the *modus operandi* of ordinary operations. I think they have about one chair (not modern) for every three or four students. The operating rooms, although located on the fourth floor, are not well lighted, and are not sufficiently commodious, as there are two or three rows of chairs back from the windows. Dental engines were numerous, and many of them were in actual use. The students are not boisterous, they indulged in no loud talking, and appeared to be somewhat older than the average dental student at home.

Located in the same building is the office of the British Dental Association, and the journal of that society is issued from thence. The Odontological Society of Great Britain is also located on the lower floors, and their museum, rich in models, casts, skulls and other valuable materials in human and comparative anatomy, is open to the student desirous of gathering knowledge. The past and present students have a society, which holds monthly meetings in the hospital, an exceedingly great advantage for the juniors. They hold annual reunions and give a dinner to encourage social intercourse. Outside the entrance is a box for con-

tributions for the support of the hospital. Soirees and subscription parties are also given from time to time for the support of the hospital. I thought, in ruminating over the subject, that if small fees were collected for all plastic filling operations, the contributions which are made by the benevolent, and the other funds coming into the hospital, might be used to reduce the cost of operations in gold, and thereby benefit the student by teaching him from actual practice the better methods of operating. I do not wish to be misunderstood in the above paragraph. The student is taught the methods, but he does not have enough practice in the use of gold while he is a student. The British journals publish a list of the operations performed in the various hospitals every month, and any one can see the justice of these remarks. Here is one of the late reports :

Monthly Report of cases treated at the Dental Hospital of London, from October 1st to October 31st, 1885.

Extractions—	Children under 14.....	378
	Adults.....	912
	Under Nitrous Oxide.....	276
Gold Stoppings.....		267
Other Stoppings.....		879
Advice.....		121
Irregularities of the Teeth....		97
Miscellaneous Cases.....		387

National Dental Hospital—same month.

Extractions—	Children under 14.....	424
	Adults.....	555
	Under Nitrous Oxide.....	614
Gold Stoppings.....		121
Other Stoppings.....		625
Advice and Scaling.....		421
Irregularities of the Teeth.....		409
Miscellaneous Cases.....		146

Each statement is signed by the respective house surgeon. No report of roots filled, or abscesses treated, or crowns or pivot teeth adjusted. The records speak for themselves. In the report of the National Dental Hospital, for the year 1885, there is a record of 9,001 fillings, of which

number 1,014 were made with gold. I have not seen the report of the Dental Hospital of London for the same year, but the monthly reports of fillings average about the same; that is to say, not quite twelve gold fillings in every hundred inserted. One unconsciously gathers from this, that the insertion of such a large percentage of fillings other than gold has a tendency to discourage thorough cleansing and preparation of cavities. Hence the frequent failure of plastic operations.

I visited the National Dental Hospital also, and the methods of teaching are substantially the same, the hours of attendance of patients, operators, house surgeons and clinical instructors, occupying about the same number of hours. This school is younger and it occupies smaller quarters, but in other respects I should judge that the instruction is quite as thorough and scientific as that given in the older school. The fees are not quite as high. I found the house surgeon quite as willing to show me the working of the school as his *confrere* in Leicester Square. I visited the hospital on a rainy morning, in the company of another American dentist, and while there a discussion arose concerning the use of filling materials. The house surgeon argued that it was almost useless to insert gold fillings for the class of patients who visit infirmaries, as such people took no care of their teeth. I took the other side, or the student's side, which was that it was a benefit to him, as it taught the use of instruments, the manipulation of gold, and that he would be better prepared to operate for himself when launched into the arena of daily personal practice. The question was not settled, but I hope that I impressed him with the importance of the proposition. This is the principal observable defect in the clinical instruction in each school. If there are forty students in a school for the year, and only 1,000 fillings of gold inserted during that time, it indicates a small average in the total number of fillings for each student.

The English student is well instructed in the use of

anæsthetics; much better than are Americans. He learns more of comparative anatomy than we teach, and generally well drilled in normal and pathological histology. Dental surgery and special therapeutics, I believe from what I saw and heard, are better understood at home, by our college-educated dentists, than by our English cousins. This is my impression from many conversations held with dentists of low and high degree. They are better mechanics in the work-shop, *en masse*, but not so ingenious or inventive. When it comes to the final examination, we must take a back seat, as the licensing bodies are not the teaching corps. When we adopt—as we must in time, and I hope very soon—that feature of professional education, then will our diplomas be like Cæsar's wife, above suspicion.

We deliver more didactic lectures in a six month's course in America than an English student listens to in eighteen months. By different methods we arrive at the same result. They consume more time, but place them side by side in practice in a working society, in the field of journalistic contributors, and our own American graduates will hold their ground quite as well as the subjects of the Queen. The amount of valuable material published in professional journals in America attests this.

The British dentist is more social, and that element in his nature almost overshadows the scientific and practical side, even in dental societies. Their method of conducting meetings of societies has much in it to commend. Members do not straggle in at all hours, after business has begun, and no talking or whispering goes on while a speaker has the floor. The business of the meeting is conducted in a dignified manner. This to some might appear dull and prosy, but it pleased me. Scientific work is no laughing matter, and for a few boisterous, ill-mannered persons to talk and laugh and whisper while a scientific paper is being read, which has required weeks or months of labor to prepare, is a poor compliment to pay to the author. Hence his decorousness impressed me more forcibly, as I have

been in society meetings where attention was almost wholly diverted from the business in hand, to listen to a story or other trivial matter.

English fees are not based on anything but tradition. There is no justice to the operator in receiving but a guinea for his maximum fee. I will not say that larger fees are not charged or collected by English dentists, but the custom for those of the highest rank is to receive about \$5.00 for each operation performed, be it easy or laborious. Americans practicing in Great Britain usually try to transplant American ideas, but they do not all succeed, as I heard of some who have adopted the English custom. Fees for artificial teeth are even higher than in America—and also lower—for in America no one ever heard of a dentist inserting a single tooth on rubber base for four shillings and sixpence—about \$1.10. As you descend in the grade of practitioners the fees decline also, fillings being inserted for a shilling, and artificial teeth going for a song. The custom prevails of inserting teeth over roots which are unfilled, and, as every one knows, it is a very filthy method.

Our American advertising dentists could learn a thing or two from the sons of Albion, were they in search of such information. The marvellous things they tell in newspapers of their exploits and their own "patent" "soft," "easy-fitting" "cushions" for "tender gums," and the brushes, powders and elixirs which they have in hand, and other allurements for the money, are too numerous to mention. These charlatans are a class by themselves.

The English operating room is not as easily entered as are ours at home, except by the favored few. Our own easy good nature and carelessness of the feelings of our patients, permits us to open our doors to nearly every caller on the most trivial pretext. They are more careful in this respect. We ought to be.

When one enters a dental goods establishment and asks for anything new, they immediately show something from America. But by persistent questioning and keeping

the eyes open, one will finally see a number of inventions and improvements on American instruments which cannot be found in America, because they are contraband. On account of the murky atmosphere in London dentists either have to operate but a few hours daily, or use artificial light. Hence there are many forms of reflectors and globes which we are unaccustomed to see. I found better nerve extractors than we can get at home; likewise syringes, explorers, files, and a number of little odds and ends which have to be picked up here and there as you see them, for, singular to relate, many of my choicest "finds" are not in catalogues or in the advertising pages of any dental journal. In conclusion I have only to state that everywhere I was most courteously received and hospitably entertained, and if I have seen some things to criticise I have been equally unsparing of things and customs at home.—*The Independent Practitioner*.

ARTICLE IV.

DEATH FROM CHLOROFORM.

Of the unfortunate death of the Lady Flora Wilmot, whilst under the influence of chloroform for the extraction of a tooth, Mr. J. Farrant Fry, the medical practitioner who administered the anæsthetic, communicates to the *London Lancet* the following observations:

I beg to forward you particulars of the recent death here from chloroform. The Lady Flora Wilmot, aged twenty-five years, had been under my care, for various minor ailments, during the last eighteen months. With the exception of a gouty tendency, her constitution was, I believe, sound. On Wednesday, February 24th, I was asked to meet her at Mr. Scott's residence at Swansea (her dentist), for the purpose of administering an anæsthetic for the

extraction of the right molar tooth. Nitrous oxide gas not being available, I gave chloroform in preference to bichloride of methylene or ether (both of which I had by me), because for the purpose I considered it the best anæsthetic, and also because her ladyship, having taken it two or three times before, expressed a preference for it. Everything about the chest being perfectly loose, and the patient sitting in the dentist's chair, less than a drachm was sprinkled on lint in an open inhaler, which the gag kept from closely fitting around the mouth and nose. A similar quantity of chloroform was added a second and third time before perfect anæsthesia occurred. The tooth was then removed, and recovery followed without a bad symptom. The patient had taken it capitally, and in all two drachms had been given. Five days afterwards (March 1st) I again administered chloroform for Mr. Scott (this time at the patient's residence) to remove the adjoining bicuspid tooth. The patient was seated in a low deep-backed, well-pillowed easy chair, and was therefore more reclining than on the former occasion. The result of the chloroform before having been so satisfactory, I again administered it in the same way, and, as before, two drachms were given in all, with a similarly good result. The inhaler having been removed, Mr. Scott took out the tooth, cleansed his forceps, and stood by the patient's side. I remarked: "I hate giving chloroform for you dentists, because you will have your patients sitting up." This led to a reply from Mr. Scott, who then poured out a tumblerful of water and asked the patient to rinse her mouth, as the gums were bleeding. No water was taken, and I observed she was not sufficiently conscious yet, and we still stood by the patient. I had, during this time, one finger on the temporal artery, whilst with the other hand I was raising the eyelid and watching the pupil, which, having been dilated during unconsciousness, had become normal and the conjunctiva sensitive. Suddenly the pupil became again widely dilated, I could no longer feel the pulse, and the face became blanched. The chair was immediately

turned back, the head lowered to the ground, and the body and limbs raised. Nitrite of amyl sprinkled on a handkerchief was applied to the nose, and, although the heart could not be felt beating, the breathing still continued for, I should say, at least two minutes. Artificial respiration, drawing out the tongue, and lifting the jaw forward, were of no avail—not the slightest sign of recovery followed. A *post-mortem* examination was refused.—*The Dental Record*.

ARTICLE V.

IRREGULARITIES OF THE TEETH AND THEIR TREATMENT.

BY F. E. HOWARD, M. D. S., BUFFALO, N. Y.

It would be impossible to include all that might be said on this subject in one paper of this kind, or even in a volume. We can only touch upon certain prominent points in the treatment of general cases presented, and the ingenuity of the practitioner must be exercised in carrying out in detail the minor points that have to be observed. No infallible rule can be laid down whereby we can accomplish definite movements of the teeth in a given direction. Judgment, ingenuity, and skill must be exercised. We are thus often taxed to our utmost in accomplishing our desires.

Among the most frequent cases presented are those demanding the bringing down of canines to their proper position, the irregularity being caused by lack of room. This usually requires the extraction of a tooth on either side to accomplish the object, and it must be left to the judgment of the operator which of these shall be selected. It may be the first molar, first or second bicuspid. If one

or more of these teeth are extensively decayed, and the others are comparatively sound, it is better to take the weaker ones out, even at the expense of appearance, for it is our duty to accomplish that which is most likely to give the greatest promise of usefulness, as well as comeliness, for the greatest length of time.

Our work as dentists should not be of a temporary character in this field; we must look ahead many years, and weigh carefully in the scales of justice and right that which we believe will be for the greatest benefit to the patients intrusted to our care.

Another very important consideration in this work is to simplify the operation as much as possible. We should not keep young subjects in our hands for months, when by simplifying the operation as many weeks would suffice to accomplish results that are practically as good—where the difference in results would only be noticed by a dentist. Very slight deviation from a normal position does not warrant interference in all cases, particularly in boys' mouths. I have seen cases where the first bicuspid occupied the position of the canine, a strong, well articulated tooth, and the canine pointing out between the first bicuspid and lateral, or the first and second bicuspids. Perhaps, in the majority of cases, we would be warranted in removing the bicuspid and pulling the canine down to place; at other times the extraction of the canine and the cutting off of the inner cusp of the bicuspid and converting it into a canine would be far better. By properly cutting the inner cusp from time to time, a slight elongation will take place that will give it a very natural appearance.

There are also cases where the canine occupies nearly the place of the lateral incisor, and the lateral assumes a very ugly position, being very prominent or depressed, and an attempted change in the position might be doubtful of success. A deviation from nature's arrangement is not always so deplorable as one might imagine. The shaping of the teeth will often cause them to lose their identity in

the original type. This can be accomplished by very simple methods, when other changes might involve long, tedious, and complicated operations, with but very slight chances for permanent success. If parents are willing to incur the expense of complicated movements, and the patient is also desirous of obtaining the most perfect results in all the little details, almost anything can be done in this direction.

When we have a narrow arch and desire to expand one or both jaws, I have found the Coffin spring plate the best for general use. The adjustment of a plate of this kind to the upper jaw will also expand the lower by the force of occlusion. The action may be confined to one or both jaws at the will of the dentist, in the construction and adjustment of the plate.

A modification of the Coffin spring will be useful in many different ways; for instance, if the arch is to be expanded in the main, a spring bent in the general form of a W is arranged in position about midway of the plate, and when vulcanized the plate is sawed through the centre, the spring slightly opened and the plate placed in position. From time to time this is spread as the case requires.

When the anterior portion of the arch alone is to be spread, a hinge made of two eyes and a bar, joined and vulcanized into the posterior portion of the plate will hold the posterior part, while the spring will act upon the anterior part alone, or this may be reversed and the back teeth spread at the will of the operator, as the case may require.

Instead of a hinge a more simple method will sometimes answer as well. Drill two holes in the back part of the plate, and with a strong silk ligature or platinum wire bind the parts together, and this will hold them from spreading at this point.

A piano-wire spring, vulcanized into the plate, is also very effectual for moving a tooth out when it is inclined in the mouth and it is not desirable to use a jackscrew. For the movement of canines and bicuspid, a band of platinum

with a projecting top or knob cemented to the tooth, is admirable to retain the rubber or silk ligature in position, and to draw the tooth in its proper course, the ligature being attached to some point on the plate, or to a hook attached to some tooth not likely to change position by the force exerted.

For the rotary movement of a tooth, a band of platinum with an arm attached and cemented to the tooth is a powerful agent for twisting such a tooth into position. Also a good and simple method for this movement, as applied to the four anterior teeth; is accomplished by tying a waxed silk thread to any of them, taking two or three turns around the tooth and attaching to a rubber ligature fastened at some convenient point in the plate. The force exerted is in a direction to unwind the ligature from the tooth, and thus it is turned in its socket.

When any one of the six anterior teeth is crowded into the arch, and the space is partly closed so as to prevent the passage of such a tooth out to position, an excellent method is to construct a Coffin spring plate for the expansion of the arch, and while the jaw is being expanded the tooth is forced out with a jackscrew, when the teeth are allowed to return to their original position.

A common class of irregularities of teeth is when one or more of the upper teeth shut upon the lingual surface of the under ones. These I find ordinarily best controlled by making a plate that embraces both jaw and teeth, keeping the teeth partly separated. A band of vulcanite is allowed to extend along the labial surface of the teeth, reaching well up. In this band, opposite the depressed teeth, slots are cut for the retention of elastic bands, and when in position they are looped over the teeth, and the force exerted is in a direction to carry them out to their proper place.

A gold or platinum band vulcanized into the plate, extending around in front of the teeth, will accomplish the same object. When once they have passed over sufficiently far, the plate is to be cut away from the grinding surface of

the teeth from time to time, then the occluding force much assists in the work.

In making radical changes in the position of teeth, more or less inflammation will ensue, and often portions of the gum will protrude between the plate and teeth. This must be reduced, from time to time, as the plate or appliance is removed. Aconite and iodine (equal parts) will relieve the inflammation, and a chromic acid solution will dispose of the hypertrophy. If it be quite prominent, excise this portion and apply the chromic acid, which will cause it to quickly assume a normal aspect.

Protrusion of the lower jaw can ordinarily be corrected in young subjects easily by making a chin cap or pan of brass, swaged to fit the chin, with two eye-loops about two inches apart on either side. These are attached to a cap worn upon the head by strong rubber bands running above and below the ear. The upper bands mainly hold the apparatus in position, while the lower ones principally do the work of carrying the jaw back.

When there is excessive development in the tooth, it may be advisable to extract one or more on either side, and carry the anterior ones back, by the usual methods. The circumstances in the case will entirely govern the operation.
—*Independent Practitioner.*

ARTICLE VI.

THE TREATMENT OF PULPLESS AND GASEOUS TEETH.

BY J. TAFT.

(Read before the Mad River Valley Dental Association.)

The precise and proper course to be pursued with teeth, the pulps of which are gone, depends upon several circum-

stances. For instance, the length of time intervening since the pulp destruction, Second, the agent and influences that have been operating on the tooth since that time. Third, the condition of the parts about the tooth.

The pulps of teeth are destroyed in two or three different ways. First, by undue using of the teeth. Second, by breaking the teeth. Third, by decay. And Fourth, by careless operations upon them.

I presume, however, the question here to be answered is, what shall be done with those teeth the pulps of which have been destroyed before they came to the hands of the dentist?

Some teeth when presented in this condition, seem to be of comparatively healthy condition as far as the tissues about them are concerned; the pulp having died and become disintegrated, and the debris simply removed by washing or some other process, a healthy condition apparently remaining at the end of the root; the crown of the tooth but little or not at all changed in color. The treatment and management of such cases is a very simple matter. Merely the removal of the debris and decaying matter: the application of some disinfectant and antiseptic; then letting the canal and pulp chamber be immediately filled with some appropriate material. Various substances have been used for this purpose.

A solution of gutta-percha in chloroform, conveyed on fibers of silk, flax, or cotton, is very efficient. Carbolized cat-gut may also be used. Of metals, lead and gold and tin may be used; either of them formed into a wire and driven into the canal or preferably, the gold and tin may be used in the form of foil. Many materials have been used for this purpose. Those here mentioned, however, being perhaps more practicable and more extensively used than any others.

The teeth in less favorable condition than the above, are those, having through the root canal more or less discharge. This will vary greatly in character. Sometimes

it is little more than pure plasm poured out from a comparatively healthy living tissue at the end of the root. In other cases, it is the product of a suppurating tissue which presents a more or less offensive ichorous discharge. This will sometimes occur when the tissue about the end of the root is not extensively involved in disease. Sometimes there is in connection with it alveolar abscess. If an abscess is not already formed care should be exercised in the management of the case, lest more disease occurs than was at first found. The discharge of comparatively healthy plasm through a root is from a living surface just under sufficient irritation to prevent healing. This irritation will usually subside upon thorough cleansing of the part, and applying antiseptic preparations. This will be effected in many cases very promptly. In others far more time will be required.

In any case how shall it be known that restoration of the part to a healthy condition has been obtained?

Usually by filling the canal with fibers of silk, flax, or cotton, not too tightly, and hermetically sealing the external opening; permitting it to remain from twenty-four to forty-eight hours, then remove and note if the silk is moistened or has an offensive odor. If it is markedly so, further medication is required. If there is no odor, and the silk is dry, the indications are favorable, and but little risk will be incurred in at once effectually closing the canal, pulp chamber, and cavity of decay. If, however, any fear is entertained in reference to the result, it is quite practicable to make another test during a longer time.

In some cases a discharge that is very offensive at first may be in a very short time greatly changed for the better, and, indeed, in many cases a return to a healthy condition be established within a few days. The agents appropriate for this purpose are iodine and creosote or carbolic acid, peroxide of hydrogen, salicylic acid, iodoform, oil of cloves, etc. A judicious selection and application from this list of agents will usually be quite sufficient, as far as topical treat-

ment is concerned. This is in the first class of cases mentioned where alveolar abscess has not been formed.

There are some teeth from which there is no appreciable escape of fluid, which, if sealed up, cause great annoyance and severe pain. This occurs from vapor or gas products. Such cases are not of frequent occurrence, but occasionally are found, and sometimes to the great annoyance of both patient and operator. The operations and treatment are the same as though the product was a fluid. The vapor or gas proceeds from the decomposition of offensive matter that must be removed or neutralized. That being done, the vapor or gas no longer appears and annoys. The treatment after this is the same as the treatment in any case of pulpless teeth.—*Dental Register*.

ARTICLE VII.

ADVICE TO THOSE WHO WEAR ARTIFICIAL TEETH.

The varied scenes and trials through which every one must pass before artificial teeth are necessary, are not easily forgotten. They remember how (in many cases by neglect) one tooth after another decayed, till the nerve became exposed and ulcers formed, producing the most excruciating pain; but now the last offending member has been extracted, and "my troubles are ended. I can now have artificial teeth in every way as good as natural ones." To correct some erroneous opinions on this point is the object of this article.

Artificial teeth, properly made, will answer many purposes of natural teeth, but no dentist can insert teeth which will answer those purposes as *well* as natural ones.

There are many difficulties attending the wearing of

artificial dentures which, in the main, by patience and perseverance, may be overcome.

1st. The presence of the plate in the mouth at first, specially when the patient has been without teeth for a long time, is a source of inconvenience. A few days of patient use will remove this trouble.

2d. Many complain of the plate chafing the gums, producing soreness. This difficulty comes mainly when the plate is inserted soon after the teeth are extracted; the gum heals over the sharp, bony points of the sockets; the plate pressing on the gums causes these points to cut through to the plate; in a few days these points will absorb, the gum heal, and the plate will be worn with ease. If the edge of the plate cuts into the contiguous muscle, of course, this edge should be cut back.

3rd. Others complain that the plate produces an unpleasant taste in the mouth. This may be because it is made of base material; when good material is used, such as continuous gum, gold, or vulcanite, this difficulty will not exist, if the plate is kept clean. When eating, fine, starchy particles of food will adhere to the plate; if not removed, it will soon sour, producing an unpleasant taste. The plate should be cleansed after each meal.

4th. The difficulty most complained of, specially in full sets (and *partial* sets where clasps are discarded) is the inability to use the teeth, when first inserted. This difficulty occurs in every case to some degree, and to overcome it, much depends on the patience, perseverance, and aptness of the wearer. To be more explicit, the upper plate is held up by suction, with a force varying from eight to fifteen pounds. The main object of this suction is to keep the plate from dropping when speaking, laughing or eating.

The teeth are required to be set on the plate at an angle of from ten to twenty degrees. The force of an ordinary bite is about fifty pounds, which, if applied to the front teeth at this angle, in the same manner in which we would bite with the natural teeth, would, of course, overcome the

eight or fifteen pounds atmospheric pressure, causing the plate to tip. The same is true in chewing on one side of the mouth. To remedy this difficulty, it is necessary for the patient to learn to press the food against the front teeth at the same time they are brought together, and at first to learn to chew on both sides. To so learn this process, till it becomes a habit, usually requires some time.—*Allport's Dental Journal*.

ARTICLE VIII.

THE MARYLAND DENTAL LAW.

BY RICHARD GRADY, D. D. S., SECRETARY OF STATE BOARD OF
DENTAL EXAMINERS.

The amendments to the Maryland Dental Law have just been published. The original law passed by the Maryland Legislature in 1884 called forth criticisms from the Pennsylvania State Dental Examining Board, the National Association of Dental Examiners and several dental journals. Two bills were before the Legislature of 1884, one emanating from the Maryland State Dental Association, and the other presented by the Dental Legislative Society. Neither bill was adopted in its entirety, but it is only just to record the fact that neither bill contained the restrictive provision, noted in the protest of the Pennsylvania Dental Examiners, *that it shall be unlawful for any one to engage in the practice of dentistry unless he shall first have passed a satisfactory examination before the Board of Examiners or shall hold a diploma from a university or college chartered by or under the laws of Maryland.*

When the Pennsylvania Dental Examiners filed their protest, the original paper was forwarded by the Maryland

Board of Dental Examiners to the Attorney-General of the State who was asked to construe the law. The Attorney-General never responded to this request, but the Governor of the State, himself a lawyer, in a personal interview, suggested that the Board continue to issue temporary certificates to graduates of reputable dental colleges outside of the State, which could be renewed every six months, and promised to second an effort to have the law amended by the Legislature of 1886.

In the meantime the National Association of Dental Examining Boards adopted the following:

"Whereas the dental law of the State of Maryland seems to be restrictive in its character; it is the sense of this body that the dental profession of said State of Maryland, at the next session of its Legislature, should seek to cause said dental law to be amended so as to be in harmony with the dental laws of the other States."

Acting upon this, the Dental Examiners of Maryland called a mass meeting of the dental profession of the State and submitted the following amendments, which after discussion, were unanimously adopted as the sense of the meeting:

Be it enacted by the General Assembly of Maryland, That sections one and eight of the act passed at the January session, eighteen hundred and eighty-four, entitled "AN ACT TO INSURE THE BETTER EDUCATION OF PRACTITIONERS OF DENTAL SURGERY, AND TO REGULATE THE PRACTICE OF DENTISTRY IN THE STATE OF MARYLAND" be and the same are hereby repealed and re-enacted, so as to read as follows.

SECTION 1. That it shall be unlawful for any person who is not at the time of the passage of this act, engaged in the practice of dentistry, to practice dentistry, unless he or she shall have obtained a certificate as herein provided, or shall hold a diploma from a university or college authorized to grant diplomas in Dental Surgery; any person holding such a diploma, and desiring to commence such practice, shall present the same to the Board of Examiners created by this act, for approval; such Examining Board, being satisfied as to the qualifications of the applicant and the

genuineness of the diploma, shall endorse the same as approved, and issue the certificate of registration provided for in this act.

SECTION 8. That nothing shall be so construed as to interfere with the rights and privileges of resident physicians and surgeons in the discharge of their professional duties.

The Legislature of 1886 on the very last day of its session repealed sections one and eight of the law of 1884 and re-enacted them as recommended by the profession without the change of a single word.

It may be remarked by way of parenthesis, that neither the Dean of the Dental Department, of the University of Maryland, nor the Dean of the Baltimore College of Dental Surgery, regarded as generous or just the law that denied recognition to diplomas granted in other States, for the one, although not present at the mass meeting, wrote in regard to the amendments: "I *heartily approve* of them and desire to see the bill passed by the Legislature;" and the other who participated in the meeting spoke in favor of them and contributed to make the vote unanimous.

The terms of office of two members of the Board, Drs. Waters and Nelson, having expired, they were re-appointed by Gov. Lloyd, so that the members of the Board continue as originally appointed by Gov. McLane, now Minister to France; namely, Dr. E. P. Keech, president, Dr. Richard Grady, secretary, Dr. T. S. Waters, Dr. Charles E. Duck, all of Baltimore, and Dr. Edward Nelson, of Frederick.

ARTICLE IX.

A PECULIAR CASE OF NEURALGIA OF THE
TRIGEMINUS,

BY H. HAMECHER, DENTIST, BERLIN.

In the first days of the month of January, a. c., Mrs. H., 52 years old, introduced herself to me, and asked me to

remove the furious pains in the right side of her face, which pains, in her opinion, could only be caused by a diseased tooth. The anxious features of the lady, the timid expression of her eyes, the bowed down attitude, and her really woeful appearance exhibited a deep-seated suffering of long duration. Mrs. H. told me that she had been suffering from these vehement pains for the last five years, that these pains appeared periodically, that they had their origin in the gum of the suffering side, and then they radiated, with the rapidity of lightning, to the foramen infraorbitale, to the arcus zygomaticus and from there towards the temple. As the gum is very sensitive to the least pressure, and as the lightest touch provokes an attack, she, who had formerly been a remarkably corpulent lady, had for the last few years, lived exclusively on cacao and mucilaginous food; in fact, the patient presented the appearance of a walking skeleton. As the act of speaking for one part, was very difficult for Mrs. H., and for the other part, was anxiously avoided, from fear of provoking a new attack, I learned from her companion the following: Mrs. H. caught a severe cold five years ago, and since that time she suffered from these pains, which were not violent at the beginning, but gradually increased in severity. Four years and a half ago the pains had become so excessive that the patient, who was treated by physicians, without obtaining any relief, went to a quack by whom she was treated with the Baunsheid-method. By this the face became terribly swollen, indeed so badly that the family physician, during the treatment, entertained fears for the life of the patient. This treatment, too, was without any success, and Mrs. H., who considered her trouble incurable, was for a considerable length of time without any medical attendance. The suffering neither increased or decreased in severity. Then, suddenly, without any apparent cause, the pains would become so bad again, that Mrs. H. was compelled to look for medical attendance once more. The attending physician, after having given, for a long while, and in large doses, bromide of potassium, quinine,

morphine, etc., declared the suffering a neuralgia of the trigeminus, for the cure of which an operation had to be performed. The patient, not feeling like submitting herself to that, applied to another physician, who gave her similar medicaments in another form. The last prescriptions, however, which were submitted to me for inspection did not contain bromide of potassium, etc., but *solutio arsenicalis Fowleri*. Mrs. H. took this solution of arsenic for many months, without experiencing the least relief. Like the nights of the last five years, the late ones have also been sleepless, even morphine had not the power of producing sleep. Outside of the fact, that the whole appearance of the patient made the diagnosis of a neuralgia of the trigeminus highly probable, the reputation of the physician, who had treated the case, seemed to me vouchsafing the correctness of the same. I accordingly declined to take any active part in the treatment, and intended to send the patient to a hospital, in order to have the neurotomy performed. But the entreaties of the sick lady were so imploring that I decided to examine her mouth.

All teeth had disappeared, the patient wearing an artificial set. To the right side of the upper jaw the roots of the incisors of the canine- and wisdom-teeth were perceptible. A pressure upon these roots did not provoke any pain, but the pains were felt as soon as the jaw was pressed in the region of the first and second bicuspid. At the request of the patient I extracted these roots, gave her internally morphine, and in large doses veratrine, to rub into the region of the temple. As was to be anticipated, my treatment met with almost no success whatever. The attacks appeared just the same as ever, but were moderated, of course by the veratrine. Finally, such an attack appeared on Friday, the 9th of January, and was so vehement that the patient came to me in despair and asked for help. With great decision she asserted that there was the root of a molar left in the jaw, from which the pains radiated. With her finger she pointed out the location of the *praemolars*.

But I could not discover anything which suggested the presence of a root in the gums. Certainly as soon as I touched the jaw, instantly the attack appeared. But this was the only symptoms that could objectively be established. The absorbed edges of the alveolus presented a little spot which felt slightly elevated. It was the well-known projection which is formed, by the healing process in case the alveolus is fractured during the extraction of a tooth. It was just this place, which was, as the patient said, the origin of her suffering, and the rigid upholding of this idea caused me to look for what might there be hidden. Of course, the operation could be executed only by having the patient completely under the influence of chloroform, which was established, not without apprehension, on account of the greatly reduced state of the patient's system. After having cut away the flesh of the jaw, there could be seen the regularly cicatrized edge of the alveolus. This was removed with a chisel, and, under this was imbedded the two-pronged root of the first bicuspid. I resealed the alveolus with a sharp forceps and removed the root. The nerve of the tooth, leading to the root, was pulled out of the alveolus in the length of about two centimetres, but did not show anything which could explain these violent attacks.

The patient recovered very rapidly. As soon as she became conscious, she laughed lively and positively asserted that now she was cured, respectively expected to be.

I saw the patient again on the 15th of January and on the 16th of February. Since the operation she sleeps during the nights, at first for several hours, and now normally; the pains decreased more and more.

At the last visit the patient told me her suffering was now so endurable that she had no desire for an improvement for the next fifty years to come.—*Dental Office and Laboratory.*

SOUTHERN DENTAL ASSOCIATION.

The eighteenth annual meeting of the Southern Dental Association will convene in Nashville, Tenn., Tuesday the 27th day of July, 1886, at 10 o'clock A. M., and continue four days.

The Association will hold its sessions in the Lecture Hall of Watkins Institute, south-west corner of Church and High streets. This Hall is equi-distant from the two leading hotels, is large, well ventilated and easy of access (no stairs).

A most cordial invitation is extended to the profession generally to be present, and to affiliate with this the representative body of dentists of the South.

The Committee has secured the following hotel rates :

Maxwell House, per day.....\$2.00

Nicholson House, per day, (single)..... 2 00

Nicholson House, per day, (double) each.. 1 50

It is very desirable, and those expecting to attend are respectfully urged to engage their rooms in advance by writing at once, stating time of arrival. On registering indicate to clerk, by personal card or otherwise, that you are attending the Southern Dental Association.

The railroads, under the control of the Southern Passenger Committee, through Commissioner M. Slaughter, have agreed to carry dentists, attending this meeting, over their roads for one and one-third fare for round trip, which can be had from local ticket agents, upon presentation of a *certificate, previously obtained* from Dr. R. A. Holliday, of Atlanta, Ga.

The trunk lines will also give reduced rates, and *certificates* can be had of Mr. J. W. Selby, care S. S. White, Dental Manufacturing Company, Philadelphia, Pa.

Greatly reduced round-trip tickets, from Nashville to the Mammoth Cave, can be had, and arrangements will be made for an excursion at the close of the session.

Those having prepared papers or essays to read,

should at once notify the Committee of Arrangements that it may be assigned a place on the programme.

Quite a number of prominent men have signified their intention to be present, and have consented to clinic. One day will be set apart for clinics, and this promises to be quite a valuable feature.

Special arrangements have been made for the demonstration of the new Crown and Bridge-Work, Dr. W. Storer How will be in constant attendance to give any explanation desired of the methods and instruments.

The display of Dentists' supplies will embrace everything of value required in dental practice, including the latest and most improved appliances.

The Committee will endeavor to furnish pleasant and agreeable entertainment for the evenings during the session of the Association.

The programme for the week, which will contain many interesting features, will be distributed at the opening.

The officers, members, and all others, are respectfully requested to be present promptly on the morning of the first day. Every indication is that there will be a large attendance, and a most profitable meeting.

W. H. MORGAN,

J. C. MORRISON,

R. R. FREEMAN,

Committee of Arrangements.

Editorial, Etc.

THE SOURCE OF SCARLET FEVER.—As the effects of Scarlet Fever are so often manifested upon teeth, the following will prove interesting :

" A report recently issued by the medical officer of the British local government board presents interesting details of an investigation which appears to have disclosed the original source of scarlet fever, and which, if provisional conclusions should be confirmed by more extended observations, may lead to the extinction of that very destructive disease. That outbreaks of scarlet fever, as of diphtheria, are often connected more or less closely with a particular milk supply, has long been known to persons engaged in sanitary investigations. It has been a familiar observation that cases of scarlet fever were frequent among the customers of certain dairymen, while other consumers, similarly circumstanced but getting their milk from other dealers, seem to enjoy immunity. The theory, however has prevailed that the persons who served the milk were affected by the disease, and when the boy who carried milk to customers was found to have scarcely finished peeling it seemed superfluous to look beyond him for a cause of the spread of the malady. The new view, to which a close study of outbreaks occurring last December in South Marylebone, St. Pancras, Hampstead and Hendon gives strong support, is that the milk itself is the cause of the fever. The districts named, and also St. John's woods, where the scarlet fever appeared at the same time, were supplied from a dairy the sanitary condition of which was excellent. None of the persons employed at it, or in any way connected with it, had had the fever recently, nor had there been a case of scarlet fever in the vicinity for a

long time. Although the dairy was indisputably the centre from which the disease was being disseminated, it was impossible to trace any source of human infection. By dint careful inquiry it was ascertained, however, that the commencement of the fever coincided in the point of time with the arrival of four newly-purchased cows, and it was found practicable to connect its ultimate distribution in different districts with the places successively occupied by these cows in different sheds the supplies of milk from which went into hands of different dealers. The four cows on examination turned out to be suffering from an erupted disease of the udders, which produced but little apparent illness, so that they continued to feed satisfactorily and to give plenty of milk. The case against the cows at last became so strong that a dealer among whose customers the fever was prevailing returned his supplies upon the hands of the farmer. The latter ordered the milk to be thrown away, but some of it was obtained from a cowman by poor people near by, with the result that there was an outbreak of scarlet fever among their children a week later. The disease attacked a half dozen families, but none that had not partaken of the rejected milk. The affected cows being placed under observation, it has been found that the erupted disease possesses peculiar characteristics, and that it not only spreads by ordinary contact among animals, but can be communicated to calves by inoculation. Matter obtained from the ulcerations has been cultivated in various media, and particularly in milk, in which it was found to flourish abundantly, producing strings of micrococci possessed of special character. The sub-cultures thus produced being used for inoculation are found to be more virulent than the original virus. Calves were made extremely ill—one was killed—by inoculation with the sub-culture, while but little affected by treatment with virus flesh from the cow. The conjecture is made that in milking a diseased cow pressure upon the udder brings down into the pail infected particles from the sore places left by the eruption, and that the milk into which they fall practically corresponds to an artificial culture of the micrococcus, such as has been found capable of exciting serious and fatal disease when introduced into calves by inoculation. Inoculated calves killed for examination were found

to be suffering from inflammatory changes in several vital organs, and especially the kidneys, of a kind absolutely indistinguishable from those that occur in the same organs in the course of human scarlet fever. That persons taking the strings of micrococci developed in milk into the stomach would have the scarlet fever has not been demonstrated by experiment, through the experience of the families that used the milk that was ordered to be thrown away may be said to point to that conclusion. To boil such milk thoroughly would destroy the scarlet fever micrococcus, if such there be. Science may, however, be invoked to provide us after a time with better means of neutralizing this and other disease germs.

Bibliographical.

DISEASES OF THE DIGESTIVE ORGANS IN INFANCY AND CHILDHOOD, with chapters on the investigations of disease and on the general management of children. By Louis Starr, M. D., Clinical Professor of Diseases of Children in the University of Pennsylvania, etc., with colored plates and other illustrations.

This excellent treatise, the most recent publication on diseases of children and their management, is a valuable contribution to medical literature, and cannot fail to be a valuable guide and assistant to both the practicing physician and the student. Commencing with the investigation of disease it comprehensively treats affections of the mouth and throat, of the stomach and intestines, of the mesenteric glands, of the liver, of the peritoneum concluding with an excellent treatise on the general management of children, which must be of great service to all interested.

The publishers, Messrs. P. Blakiston, Son & Co., Philadelphia, have presented the present edition of this work in handsome style and large type with finely executed engravings.

FACIAL PROSTHESIS.—By C. Edmund Kells, Jr., D. D. S., of New Orleans. This is a small pamphlet containing the reprint from *New Orleans Medical and Surgical Journal*, of an article describing an operation by which an artificial nose was applied in a manner altogether satisfactory to the patient, and exhibiting great skill on the part of the operator.

Illustrations show how a great deformity was happily corrected.

THE THERAPEUTICS OF HIGH TEMPERATURES IN YOUNG CHILDREN.—By William Perry Watson, A. M., M. D., reprinted from *Archives of Pediatrics*. Publishers: John E. Potter & Co., Philadelphia. This is the substance of a clinical lecture delivered in the New York Polyclinic, and treats the subject in a very comprehensive and enlightened manner.

REPRODUCTION OF TISSUE BY SKIN GRAFTING.—By Wm. H. Atkinson, M. D., D. D. S., New York. This is the substance of an address before the New York Odontological Society.

ATMOSPHERIC PURIFICATION.—By David Prince, M. D. This treatise in the form of a pamphlet of some 20 pages, is written with the conviction that it presents an advance in the art of avoiding some of the enemies of life.

ADDRESS BEFORE THE ALUMNI ASSOCIATION OF THE DEPARTMENT OF MEDICINE AND SURGERY OF THE UNIVERSITY OF MICHIGAN.—By Charles J. Lundy, M. D.

Monthly Summary.

HOW TO BECOME THIN.—The “beefsteak and hot water cure” for obesity is thus described by Dr. Solomon Smith in the *Lancet*. The course consists in drinking nothing but hot water, and eating nothing but animal food for seventeen weeks. The water is taken in four doses daily, at a temperature of from 130° to 150° Fahr., on an empty stomach, and at least one hour before a meal. The daily average of solid food is 5 lbs., chiefly lean beef; a little plain boiled codfish occasionally.

A patient describes the effect of this treatment as follows: “Two years ago, I weighed (dressed) 16 st. 4 lbs., and my figure was of tubby, aldermanic contour, I am now 13 st. 2 lbs. My waist girth was 44½ inches; now it is 35 inches. I suffered from chronic heart-burn; I have had none of it for fifteen months. I went in daily fear of painful kidney attack; I have not had a symptom of it since I began the hot water. I sleep better, and do both my mental and physical work more easily, and, in fact, feel a much younger man than formerly.”

The first thing to bear in mind is that the water is essential; without it, the meat would kill; the next is, that the success of the treatment depends on the possession by the patient of fairly capable kidneys; and the next, that the quantity of meat prescribed is for the cure of the obesity, and not necessarily for that of the lithæmia, the hot water being often useful in cases of lithæmia in conjunction with a mixed diet, the great condition being that no fluid should be drunk at meals.

In the treatment of the lithæmic condition, one finds one's self constantly on the horns of a dilemma, if meat is ordered, the malady is aggravated; if vegetables, the patient suffers from flatulent indigestion, hence the compromise usually re-

ommended ; namely, as little meat as the patient can get on with, and such vegetables as he can digest, the whole tempered by occasional blue pills and salines.' It must be distinctly borne in mind that this course of diet must not be recommended until we have assured ourselves of the capacity of the patient's kidneys as excretory organs.—*N. W. Lancet*.

PROFESSOR HUXLEY ON SMOKING.—At a certain debate on smoking among the members of the British Association, Professor Huxley told the story of his strugglings in a way which utterly put the anti-tobacconists to confusion. "For forty years of my life," said he, "tobacco had been a deadly poison to me. [Loud cheers from the anti-tobacconists.] In my youth, as a medical student, I tried to smoke. In vain ! At every fresh attempt my insidious foe stretched me prostrate on the floor. [Repeated cheers.] I entered the navy. Again I tried to smoke, and again met with defeat. I hated tobacco. I could almost lend my support to any institution that had for its object the putting of tobacco-makers to death. [Vociferous cheering.] A few years ago I was in Brittany with some friends; we went to the inn ; they began to smoke and looked very happy, and outside it was very wet and dismal. I thought I would try a cigar. [Murmurs.] I did so. [Great expectations.] I smoked that cigar—it was delicious ! [Groans.] From that moment I was a changed man, and now I feel that smoking in moderation is a comfortable and laudable practice, and is productive of good. [Dismay and confusion of the anti-tobacconists. Roars of laughter from the smokers.] There is no more harm in a pipe than there is in a cup of tea. You may poison yourself by drinking too much green tea, and kill yourself by eating too many beefsteaks. For my own part, I consider that tobacco, in moderation, is a sweetener and equalizer of the temper. [Total rout of the anti-tobacconists, and complete triumph of the smokers.]—*Medical and Surgical Reporter*.

DISTINGUISHED HONOR.—It is, doubtless, a matter of gratification and pleasure to all true members of the dental

profession, to know that a high honor has been conferred upon one of its members, one too, for whom the universal suffrage of the profession of this and every other country would have been rendered, had the question been one open for such an expression.

John Tomes has been knighted by Her Majesty, England's sovereign, the second dentist of the world to receive such a distinction. The first was Sir Edwin Sanders, whom all were delighted to have thus honored. In certain lines of scientific and practical work, Sir John Tomes has done more than any man now living. It may be said that he has had great opportunities, but he has improved these as scarcely any one else would have done. It may, with equal truth, be said, that the period of his greatest labor was one in which there were great adverse environments. Embarrassments were met and overcome by him that the dentists of this day know little or nothing about.

The facilities for the prosecution of his work were meager indeed as compared with those of the present. He had not the stimulus and moral support in the recognition and appreciation of dentistry that now obtains.

In spite of difficulties, he achieved a reputation and position in his chosen profession second to none in his own or any other country.

He has done more than any one else to secure for the dental profession a legal recognition and status. He formulated, and had enacted, the best law for the regulation of dental practice that has as yet appeared.

Sir John Tombs has conducted the great work of his life without exciting any special antagonisms, prejudices, or jealousies, which is one of the best evidences of a great and good man.—*Dental Register*.

FINAL RESULTS OF OPERATION FOR CANCER OF THE LIP.—Interesting statistics concerning the therapeutic results of the surgery of this affection, are collected from the clinic of Bruns, Tuebingen, by A. Woerner. From an abstract in the *Centralblatt f. Chirurgie*, we learn that of 305 cases operated

upon at Tuebingen, the affection occurred in females as compared to male patients in the relation of one to nine. The average age was 62 years. In 236 cases no mention is made as to the tobacco smoking habits of the patients. Fifty-one were inveterate pipe-smokers. In eleven cases a trauma was the first origin; in seven cases neglected warts became the seat of the first start. In sixteen cases the upper lip was affected. Of the 305 cases 217 were operated upon by 354 different operations. Simple excision and union seemed sufficient in 224 cases; in 28 resection of the maxilla was necessary to total removal. An interesting statement¹ is that one male patient, whose case was inoperable, and who was treated by electrolysis, developed a violent erysipelas. With the subsidence of this, the tumor had almost vanished. The man had no return and died one and a half years after from other causes. Of the 277 operated patients recurrence of the malignant growth ensued in 111 persons; 87.2 per cent. recurred inside of a year, 12.8 after a year. Of the 160 cases that showed no return, 71 or 25.6 per cent. died from other causes, after an average duration of life after the operation of 8.4 years. The 89 that still lived averaged 5.8 years since the operation. Of the whole number, 160 cases, 106 lived over three years; hence the latter number certainly may be considered as permanently cured. Woerner also compares the previous reports on this subject made by Thiersch v. Bergmann, Billroth, Kocher, etc. The sum of these observations is 866 cases. These patients show results very close to the figures of Woerner. Of the whole number of returns, 87.6 occurred within the first year. The per centage of those that survived three years without a return was 28.1 per cent. as compared with 38.2 per cent. at Brun's clinic.

FUN AMONG THE DOCTORS.—One of the most amusing things in connection with the welcome given the members of the American Medical Association by the citizens generally—was a window piece gotten up by Fraser, the Candy Man, at 609 Olive. He obtained a large number of young ducks, had their skins stuffed and mounted, and seated them in chairs in a little amphi-theatre. The desk in front of each was marked with a parody upon some quack nostrum, and advertisements of patent remedies graced the walls. Among the delegates was a black duckling labelled "hoodoo." The whole was entitled "The other Convension." The hit was palpable and enjoyed by the visiting medicos.—*St. Louis Med. and Surg. Journal.*

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ARTICLE I.

THE PREPARATION OF THE MOUTH FOR AND
THE INSERTION OF ARTIFICIAL TEETH.

BY JOHN TRUDE FRIPP, L. D. S., EDIN. & I.

(Read before the Students' Society of the National Dental College.)

Mr. President and Gentlemen: The subject which I have chosen on which to invite discussion this evening is one which, in the view of some members of the profession, does not take very high rank in the scale of scientific subjects. There are some, I believe, who consider that the profession should be divided into two branches, one (the higher) the operative; the other (the lower) the mechanical.

I have heard, although I do not personally know it for a fact, that there are some practitioners who confine themselves entirely to operating, leaving the insertion of artificial teeth to other men.

Whatever may be the case in some comparatively few

instances, there is no doubt that the vast majority of the men in our profession lay themselves out for general practice, or, to quote a phrase seen sometimes in advertisements, "Dentistry in all its branches."

Although it may seem very respectable and refined (especially from their own point of view) for a few men to speak of the operating room as the only sphere worthy of their presence and attention, yet the fact remains that, speaking generally, the man who is not a good mechanic will not be a good or successful dentist.

The powers that be, recognizing this fact, have in their wisdom required that the first part of the dental curriculum shall be a three years' apprenticeship to mechanical dentistry.

In no profession is the demand greater for versatility, for readiness of adaptation to any and every circumstance that may arise, than in our own. A man should be equally at home with the engine or the lathe, the forceps or the blowpipe, filling teeth or mounting them, conserving the mouth or supplying its deficiencies. The man who is not able to perform every detail of work, whether in surgery or workshop, for himself, will never be able, should he ever get the opportunity, to direct assistants in their work for him, or to decide whether the work is or is not properly performed. Such a man would be scarcely likely either to make or maintain a successful practice.

Be a man ever so good an operator, yet if he have not the tact or skill to make a good fit or a suitable match, his reputation is likely to be of very slow growth and his connection correspondingly small; while a poor or indifferent operator (that is, in the matter of saving teeth) will, in many cases, if he be clever and skilful in the adaptation of artificial teeth, rapidly make a large and remunerative practice.

Mind, I am not saying that this should be the case, but simply recognizing what I believe to be a well-known fact. I believe very thoroughly in conservative practice, but seeing that so great a demand exists for what the Americans call "Prosthetic Dentistry," a demand which is probably

greater now than at any previous time, and which is constantly increasing, is there not room for very great improvement in this branch of our work, and should not greater and more intelligent care be bestowed upon it?

How many of the cases which come to us give the idea that the operator took the models and forthwith handed them to an assistant in the workshop, with few or no instructions, leaving him to "set up" the teeth according to the best of his ability, without any regard to the character of the mouth and face with which the new denture should harmonize? The case thus "mechanically" made is put into the mouth whether satisfactory or not, in a large number of instances decidedly *not*. Now this serious fault is committed not only by those from whom it might be expected, that is the advertising quacks, who may be supposed to make teeth by steam machinery, but many of those who hold good names and high places in the profession are guilty of inserting in the mouths of confiding patients work which I venture to say they would not care to meet again in the presence of their professional brethren.

The only excuse which can be urged is want of time, and this should be no excuse at all, since if a man have not time to do work properly himself or see that it is done properly by others he ought not to undertake it.

It is probable, however, that with most of us the danger of having too much work to do is a somewhat remote one, and if we do not our best to meet the requirements of each case entrusted to us we cannot shelter ourselves behind this flimsy excuse.

In my paper this evening I do not expect to advance anything new, and it will no doubt be found as the discussion proceeds that my own knowledge is sadly deficient in many respects. The fear of disclosing my own ignorance does not in any way deter me from introducing the subject, because my object is not to teach but to learn, and to elicit discussion which shall be mutually profitable. It is impossible for me to speak too highly of the advantage which I

have personally derived from the meetings of our Society, and I am hoping that this evening I shall go home with a larger store of knowledge than I brought with me. To proceed now to the direct consideration of my subject. "The preparation of the mouth for and the insertion of artificial teeth."

A large number of the patients who consult us for the purpose of getting supplied with artificial teeth (perhaps I ought to say the *larger number*) are those who have greatly or entirely neglected the mouth in the past, and have simply allowed it to go to ruin. As the consideration of such a case will afford us the best means of dealing with our subject, I will take a supposititious one which will find its counterpart in actual every-day practice.

A patient presents himself, with a mouth in which half of the upper teeth are irretrievably lost. Two or three front teeth too bad to make a decent appearance if filled, or decayed away to the stumps. Some molars and bicuspid on both sides gone also, stumps remaining. In the lower jaw six front teeth probably in good condition, that is free from decay, but much covered with tartar; perhaps one or both bicuspids either side also remaining: first molars have been extracted, second and third molar stumps still existing.

I think this is a fairly typical case. What shall we do with it?

The old plan, which I was taught, and which I regret to say, I practiced in my early days, was to get, first, the nippers and stump file, and proceed to reduce all the ragged edges to the level of the gum—not to extract anything unless the patient was in actual pain. Models taken, the pieces were made, materials according to the means of the patient, but always held in by three or four wires or bands in the upper, two clasps in the lower. Simple, expeditious mode of treatment, no pain given, patient pleased, fee paid, operator satisfied. The sequel of such a case is well known.

Fairly comfortable for a time, but mouth never healthy,

breath unpleasant, the denture being only seldom (in some cases I have known by the advice of the dentist, never) removed, the patient finds after awhile that the supporting teeth are becoming sensitive, and that any effort to remove the plate produces great pain and discomfort. Besides this injury to the supporting teeth, the stumps also are often tender; a slight cold, or other derangement of health, giving rise to periostitis and gingivitis, and making the toleration of the teeth for a time almost impossible. On raising the lips we shall probably find a number of more or less active volcanoes in the shape of disgusting pus-discharging sinuses. Either the dentist is again consulted and a little patching done, or the patient waits in constant uneasiness until all the remaining teeth are lost, and then the work has to be commenced all over again. Either all the roots must be removed, or more likely a complete set made over them, to be kept in place by springs, and the roots left to be thrown off as nature can best manage that process.

This is the plan which used to be adopted, and which, I am sorry to say, is not discarded yet by many who ought to know better.

I cannot too emphatically say that such a course is to be most strongly condemned, unless the patient's health or some other urgent and imperative reason stand in the way of proper treatment. It should then only be undertaken after explanation or under protest.

Discarding this "old way," as I am sure we shall all be agreed to do, again we ask, "What shall we do with the case?" A great authority, Mr. Spence Bate, has recently said, in a paper on "Excision versus Extraction," read before the British Dental Association, that "neither stump nor tooth should be removed that is healthily implanted in its alveolus or could be made so." And then proceeds to an enumeration of some of the cases in which roots should or must be removed, all the healthy ones being treated and filled. We have the greatest respect for this most thorough conservative surgery, and it must be a great pleasure to a

man to be able to restore to perfect health a mouth full of stumps, without putting his patient to the pain of a somewhat formidable operation.

But, I would ask, how often does it come within the range of possibility, or at least of practicability, to treat and fill a large number of stumps? Supposing the operator to be willing, the patient would, I think, seldom be found who would be able or willing to give the required number of sittings, or pay an adequate fee for the time and labor employed.

Again, however good in theory, it seems to me to be bad in practice to remove here and there a diseased root and leave here and there a good or healthy one. The surface of the jaw is rendered very irregular, the yielding gum and the unyielding stumps alternating and making the comfortable fit of a denture much more difficult to obtain.

Of course where only upper front stumps are in question they should, if possible, be treated and pivoted. In such a case there could be, I think, but little difference of opinion.

There is yet another reason why, except for the purpose of pivoting or otherwise fixing artificial crowns, dead stumps should not be left in the mouth, and that is that they are so frequently exostosed, and give rise to more or less severe neuralgic pain and disturbance, the patient in many cases being entirely unaware of the cause of the pain, and in some cases I have known obstinately sceptical when the cause has been pointed out.

It will no doubt have already been gathered from the tone of my previous remarks what my own treatment would be of such a case as that instanced.

I should carefully look round the mouth, and a few minutes' inspection would enable me to decide what teeth should remain and what be removed. Having due regard to the position of the teeth and the antagonism of the jaws, all the sound teeth should be left, and also such teeth as can be made good by filling, and all tartar carefully removed.

All doubtful teeth—and on this I would lay great emphasis—should be extracted, and also all the stumps. Many an otherwise satisfactory case has been to a great extent spoiled by leaving in the mouth one or more teeth which (it was thought) might be made good, but which did not prove amenable to treatment, and eventually had to be extracted, much to the chagrin of the operator and dissatisfaction of the patient.

I know that several objections may be urged against this mode of treatment. Some will say that the shock to the patient in a case of such extensive extraction will be too great. As a matter of actual practice I have found that generally a patient suffers little if any more shock or after-pain from the removal of a dozen than from the removal of three or four teeth.

Another great objection frequently urged is that there is so much difficulty in the length of time the patient must wait for the settling of the gums; a period of several months or a year. I put in a set of teeth some time ago for a woman who had all her teeth extracted at a Dental Hospital, and, acting on the advice there given her, had waited in a perfectly edentulous condition for twelve months. I also saw in the *Dental Cosmos* some time ago an advertisement of a practice for sale in which one of the points urged was "so many dollars' worth of work in hand" in the shape of mouths waiting until fit for the insertion of artificial teeth.

X To the practice of keeping the patient waiting thus without teeth there are most serious objections. It is almost like condemning him to a slow starvation, for little if any solid food can be taken. The muscles of the mouth and face become so seriously contracted that the natural expression is greatly interfered with and can never be properly restored, and in many cases the contraction is so great that a set of the proper size cannot possibly be inserted.

A year or two ago I heard a conversation in the extraction room below between several gentlemen, one or two

of whom were officers of the hospital. The subject was the difficulty of making an equitable arrangement in the charges for temporary and permanent sets of teeth. If a temporary set were inserted the patient did not expect to pay the full fee, and yet for any subsequent set they objected to the full fee, saying, "Mr. So-and-so had only charged *so much* for a set."

This is a difficulty which in actual practice I do not find to exist. For some years past I have ceased to talk about temporary sets as I do not believe them necessary.

X My plan for a long time past has been to put the new case in from twelve to twenty-four hours after the extraction, or even less, explaining to the patient that perhaps at the end of a year a refit will be necessary; but as an actual fact it is very seldom required, the gums to a great extent shrinking and settling to the shape of the denture.

I will just instance a case which I had the opportunity of seeing during the last month. A lady from Yorkshire came to consult me about putting her mouth in order, and arranged to stay with her friends close by until I had finished. This was about two-and-a-half years ago. I administered the gas to her twice each day for three successive days and removed twenty-six teeth. Within a few days I put in a new set, vulcanite upper, cheoplastic lower, telling her she would probably want them remodelled in a year's time. I saw her once or twice to relieve the set during the next week or two, and she then returned to the North. I heard from her friends again and again that she was very comfortable, and now at the end of two-and-a-half years she assures me they are more comfortable than ever, and she can speak and eat with the most perfect comfort. I should have said she came to see me because a good man in York City had told her he must keep her without teeth for three months.

Since adopting this plan I bought Mr. Oakley Coles' book on "Dental Mechanics," and there found to my great satisfaction that I was in most excellent company. If you

will allow me I will give you a paragraph from his book *in extenso*.

He says, "The question how soon after extraction artificial teeth may be inserted is one of great perplexity if the operator be unguided by practical experience. Theoretically, one would consider that a considerable time should be allowed to elapse. From my own experience, practically, I consider twenty-four hours enough; that is, I have many times taken out ten or more teeth one day, and put in a full set of artificial teeth the next day, and I have found the least absorption, especially in comparatively young subjects, in those cases where the shortest time has elapsed between the operation and the insertion of a new denture. Beyond the advantage of ready treatment which this plan offers, there is the still greater benefit of preserving more completely the contour of the face. Many practitioners consider that a temporary set of teeth may be fitted in at the end of a fortnight or three weeks, and a permanent set at the expiration of twelve or eighteen months. I have found, however, that those dentures that I have fitted in immediately after operating have fulfilled every requirement of a permanent set, so that no further change has been necessary."

This exactly coincides with my own experience, but I must add to it a little fuller explanation of my own mode of practice.

The impression being taken immediately after the extractions, with composition as soft as possible, and kept in the mouth a good while to get hard enough to be withdrawn without "dragging" or "sucking," it is put into cold water and sent to the workshop to be cast immediately. I then select the exact teeth for the case, and try them by putting them right up into the sockets, and I then know that those teeth will fit in without any grinding or fitting, going into the socket from an eighth to three-eighths of an inch. I am referring now specially to the six or eight front teeth, though in many cases the molars also may be put a considerable way into the sockets.

In a case which I have in hand while writing this paper I have removed all the back teeth on both sides in the upper first, leaving the six fronts until last, in order that the sockets may only be vacant one day.

When the model is cast it will be found that the sockets are well marked though not deep enough. Each socket must then be carefully deepened until the tooth will fit into the model as deeply as it did into the gum. When all the teeth are thus placed in position they may be waxed on to the model, and the palate being put in the piece will be ready for flasking and baking.

In cases where the bite is close, or where we desire to make a specially strong and good frame, flat teeth may be chosen and backed either with gold or dental alloy, and when fitted into their sockets a wire bent round so as to touch every tooth, the whole waxed together and carefully lifted off the model and invested in plaster and sand for soldering. By this plan an exceedingly light and strong case can be made.

In cases where only three or four teeth are required the plan I have described is exceedingly satisfactory. I will mention one which I did a week or two ago. I removed one central incisor and both anterior bicuspidis at twelve o'clock, and at six put in the new teeth backed with dental alloy and strengthened with wire soldered to each tooth and the whole mounted on a vulcanite palate. Four days after, being on a visit to the patient's house, I examined the mouth, and found that on raising the lip it was impossible to tell which of the centrals was the new one, so perfectly had it fitted into the gum, and so exactly alike were the festoons of the gum over natural and artificial teeth.

One point it is very important to observe. The *teeth should always on first putting into the mouth be too long by an eighth of an inch or so, as they sink into the gum considerably afterwards, say in the course of a day or two.* Some cases which, when first put into the mouth, look as though indisposed to fit up in their places I find to work up into the gums and fit as snugly as could be wished.

Where only a few teeth have been extracted and the mouth is not very ragged, gold or dental alloy plates may be used if desirable and with perfect success. I have with me a couple of models in which gold and dental alloy were used, and you will see where the sockets have been cut to receive the teeth.

Of course there will be a subsequent shrinkage of the gum, and the festoon of which I have just spoken, will not in all cases be preserved ; but if the tooth be inserted far enough into the socket the shrinkage can seldom or never be sufficient to allow the end of the tooth to project or catch the lip.

We are all familiar with the appearance of the mouth in which teeth have been inserted a few weeks after the extraction. The teeth being short, the gums have gone away from them entirely, and the denture may easily be removed by the action of the lip upon the projecting and uncovered teeth.

In the plan I have been advocating the teeth are of necessity brought further in at the necks, indeed exactly in the position of those they supersede.

Another important feature is that the pain to the patient is much less when the teeth are put into the sockets.

When once the sockets are closed the teeth must be put outside the gum, and any pressure at once pinches the gum between the alveoli and the new denture, giving rise to great pain, and often necessitating a further shortening of the teeth at the cervical end.

I have found that after the first few hours or a day the pain and tenderness have in most cases almost entirely passed away. In order that the perfect adaptation may be maintained I usually instruct patients not to allow the new case to be out of the mouth at all (except for cleaning after meals) for some weeks, until the gums have fairly settled, and after that to use their own discretion about wearing it at night.

In cases where the lower back teeth have been extracted

I do sometimes think it better to wait for awhile, as the teeth cannot be put into the sockets as in the upper, but, as in the case I instanced just now, when it has been necessary to insert at once, the teeth usually fit very well.

I have generally recommended a mouth wash of Condy's fluid or permanganate of potash, until the gums have well healed.

I should like to say here that, notwithstanding the very extraordinary case which Mr. Spence Bate mentions in the paper from which I have already quoted, of a woman who went mad after the extraction of a number of teeth, I believe that it is very rare for any untoward results to follow that operation. I cannot call to mind any other that I have heard of, although many times I have known patients to regret exceedingly that the stumps were *not* removed. I have never known a case during the nearly twenty years I have been connected with the profession of regret being expressed or any trouble ensuing after the removal. All my experience has been entirely the other way.

It will, no doubt, be felt by some that it must be somewhat inconvenient to be obliged to get the cases done so quickly, especially if several of them be in hand at once. It is inconvenient sometimes, but the result is worth the inconvenience and trouble. But if a judicious selection of teeth be made, there is so little fitting required that a case is very quickly got out of hand. I have in many instances cut the sockets in the model and put the teeth all in order in ten minutes or a quarter of an hour from the taking out of the models, and given to my assistant to wax up and vulcanize at once.

Mentioning the fact of putting the teeth in order reminds me of one thing which I had almost forgotten to say, it is this—If men undertake to supply artificial teeth they should either see to the arrangement of them themselves or get an intelligent assistant who can see the patient's mouth and receive instructions in the surgery and then arrange the teeth artistically. How seldom do we see Nature's

irregularities copied, and how often do we see, much to our disgust, rows of teeth "set up" as regularly as the keys of a piano and the edges as even as if smoothed with a file?

So frequently teeth are put into the mouths of elderly patients as perfect as we could wish to see at the age of blushing sixteen.

The depots provide us now with a marvellous assortment of teeth ready to hand, such as we can scarcely wish or imagine to be surpassed; but the hand and eye and brain of the dentist are all needed to so arrange and adjust them that they may be life-like, instead of obviously artificial. "The height of art is to conceal art" is a motto which every dentist should remember.

A little chipping of the corners, roughing slightly the polished surface, staining if necessary, and many other little devices which will occur to the mind in practice, go a long way in making our work satisfactory to ourselves and pleasing to our patients.—*London Dental Record*.

ARTICLE II.

PROSTHETIC DENTISTRY.

BY JAMES B. HODGKIN, D. D. S.

What is the condition of prosthetic dentistry in this country at the present time?

Although this question has been often answered in papers and reports of investigations read before dental societies, in discussions of the same, and in articles published in our journals, it is proposed again to call attention to it, and to continue to do so until the profession is induced, if possible, to remedy existing faults in that direction, which,

in some cases, come very near being, if they are not, crimes.

The broad statement is made in the beginning, that while operative dentistry has, in the treatment of decayed teeth and diseases of the oral cavity, made giant strides and almost incredible progress, so far as both science and art are concerned, in the last thirty or forty years, prosthetic dentistry has, in both these respects, rather retrograded, than advanced, with the mass of practicing dentists. It cannot be truthfully denied that praise and credit for the former, as well as blame for the latter, belong to the dental profession; and it is a duty incumbent now, as it always has been, on its members, to remove the just cause for this blame.

The true cause for this seems to lie, and doubtless does lie, in the fact that in prosthetic dentistry the great study, as a general rule, has been to produce the cheapest possible substitutes for the natural teeth and oral tissues lost by the ravages of decay and disease. In this effort both art and science have been sacrificed to cheapness and ease of manipulation. In the face of the rule that "the beauty of art is to conceal art," there are comparatively very few cases in which artificial teeth in the mouth cannot be detected as such at a glance by the most casual observer. The teeth themselves are caricatures of the natural organs, not adapted in color, shape or arrangement, to the physiognomy of the wearer, while in the formation of the plates to which they are attached, no attention is paid to the restoration of the original and natural form and appearance of the face.

But this offence against art and esthetics is not so grave as that which, in the pursuit of cheapness, or in supplying the demand on the part of the mass of the people for cheap dental plates, is regardless and reckless of the pathological effects of some of the cheap materials used for that purpose.

It is very interesting to any one who has the inclination (I was going to say, and time; but if the inclination exists, the time can be found) to investigate this subject, having before him its conditions forty years ago, with the sub-

stances since proposed for the material used for "bases" (to use a modern term) for artificial teeth at that time, and the consequent different manipulation required for each substitute. Gold was then *the* material for dental plates, platinum being used very rarely, while in many cases temporary plates were made of silver. The latter metal, however, was objectionable even for temporary plates, on account of its ready conversion into salts of silver in the mouth.

The two former have to this day held their places as being entirely unobjectionable, in a hygienic point of view, for any form of dental appliance, even though the gold should be alloyed with silver and copper down to an 18-carat quality. It is universally admitted that these two metals and porcelain do not produce any deleterious effects on the oral structures and tissues, nor on the system generally. With the exception of pure block tin and a very few alloys formed into plates by casting, all the substitutes offered for these are more or less injurious, either locally or generally, or both.

While some alloys composed of base metals, as, for instance, Blandy's cheoplasty, have gone entirely out of use, on account of the chemical changes they undergo in the mouth, no metal or alloy formed into plates by casting, however unobjectionable in that respect, has come into general use, because of the uncertainty of making a good casting and the skill and experience required to overcome that difficulty. One of these causes, viz., the skill required, connected with the great cost of the material, and consequent high price to the patient, has driven out of general use artificial dentures made of gold or platinum, with porcelain, or of porcelain alone; but the fact still remains that they are the best, in every respect, that can be worn. They have to that extent been transplanted by the vegetable bases which have become so popular within the last twenty-five or thirty years, on account of cheapness and ease of manipulation.

The principal of these are India-rubber (caout-chouc) and cellulose, compounded with other substances to give the former hardness and color, and the latter plasticity under heat, and color. The compounds of these so formed and most used, are hard rubber, or vulcanite and celluloid. The former alone will be spoken of, as it has, since the expiration of the Cummings patent, been rapidly taking the place of the latter, on account of its greater ease of manipulation and its greater durability, and is now so generally used that it may be safely said that there are comparatively few artificial dentures made with any other material. It is admitted by all that the introduction and adoption of this material for dental bases has not been an advance step by the profession, either as regards art or science. It has certainly lowered very much the artistic standard of work in prosthetic dentistry. In a scientific point of view, it has been, in the opinion of a great many of the most prominent members of our profession, productive of serious injury by its effect on the mucous membrane of the mouth and subjacent tissues; so serious that its use has been condemned and its abandonment urged. These opinions, based upon careful observation of facts, have been frequently expressed, since 1869, and can be found on record in the proceedings of dental societies and associations all over the country.

The list of those expressing these opinions is long, and but few will be named. These are Drs. Taft, Atkinson, Chase, Watts, Walker, Cutler, Allen, Eames, Cushing, Morrison, Crouse; all so well known that their names have become familiar as household words in the profession.

The character and symptoms of the pathological conditions (known commonly as rubber sore mouth) produced by the use of rubber plates, have been from time to time described in the proceedings of Dental Societies and Associations, and vary from slight irritation of mucous membrane to ulceration of soft tissues and necrosed bone, with discharge of blood, ichor and pus. One of the worst characteristics of this disease is, that in its progress from simple

irritation to ulceration, sloughing and necrosis, it does not, as a general rule, give sufficient pain to warn the patient of danger. The prevalence of these injurious effects may be judged from what Dr. Kulp said before the American Dental Association: "Since the discussion in the Society, I have myself examined 500 cases, and, with the help of some of my friends of the profession, there were in all 1100 cases examined, in three-fourths of which this disease was found;" and from what Dr. W. H. Dorrance said, in a paper read before the same body of the results in 211 partial and full upper cases which he had examined, 165 of which were rubber, and 46 celluloid. In 91 per cent. of these the effects were marked, 47 per cent. of which showed a diseased condition in an aggravated form, and in the remaining nine per cent. there were no effects at all.

Dr. J. R. Walker said before the Southern Dental Association, "That, having satisfied himself of its injurious character, he had abandoned the use of rubber, and called in all his rubber plates for exchange. That this having brought under his observation not only his own patients, but many others; for many years not a day passed that in his office practice he did not see well-defined cases of the specific rubber disease in one form or another, its manifestations being as varied as the old-fashioned liver complaint. Since all the efforts and warnings on the part of so many active and prominent dentists have proved ineffectual to stop or check, to any great extent, the use of a material which produces so generally such baleful effects, the question naturally arises, and it is one which it is the duty of the profession to study and answer. Is there any way to render rubber dental plates harmless, since their use cannot be prevented? Dr. Walker, of New Orleans, Dr. Sturgis, of Quincy, Illinois, and others, found that in cases where the patients, from pecuniary or other reasons, were not willing to discard perfect fitting rubber plates, they cured the disease for the time being, by lining or covering the palatine surface with tin or gold foil.

This, however, was only temporary, as the foil as they applied it soon came off. These gentlemen, and all who have tried it, have found that in cases where the disease existed, and had gone no further than to affect the mucous membrane and immediately subjacent tissues, the interposition of a foil of pure metal, which the secretions of the mouth would not change chemically, between the plate and the mucous membrane, cured the disease,

The difficulty with them was, that they could not attach the foil to the plate permanently. This difficulty has been apparently met, as there are now advertised two or three linings for rubber plates, for which it is claimed that they adhere permanently to the rubber.

Here we have the two indispensable conditions complied with; the first in pure gold foil, which undergoes no chemical change in the mouth; the second in the claim that a permanent union can be made between this pure gold and the rubber plate. I have examined one of these advertised linings, and found that the pure gold could not be separated from the rubber by any means, or removed except by scraping, and then a portion of the rubber was scraped off with it.

With this means offered of curing so great an evil, it would seem to be the duty of every dentist to line every new rubber plate that he makes with pure gold, and to examine all those worn by his patients, and apply the lining in every case where the symptoms of the disease appear.—
Dental Office and Laboratory.

ARTICLE III.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA

The regular meeting of the Odontological Society of Pennsylvania was held Saturday evening, November 7th,

1885, at the office of Dr. Tees, 548 North Seventeenth street, President Darby in the chair. The following paper was read :

THE PHILOSOPHY OF THE TOOTH-BRUSH—ITS CONSTRUCTION
AND PROPER USE.

BY W. G. A. BONWILL, D. D. S.

I am not aware that any one has ever written a dissertation upon this subject. There has been some talk on the hygiene of the mouth, during the past year, but no one has attempted to explain the philosophy of a tooth-brush : how it should be constructed, and its proper use. It is a lamentable fact that but little thought and ingenuity has ever been given to it, although thousands of shapes have been furnished by dentists and others. I must confess to my own shortcomings, up to the year 1876. I had not, up to that date, ever sold brushes, powders or washes from my office. It looked too much like trading. I always told my patients to go to drug stores and select for themselves.

My attention was arrested, in 1876, by two remarkable cases : Two bachelor brothers had left their dentist on account of not being able to arrest the disease which, he said, was fast cutting their teeth away, both upper and lower. It was noticed that a groove near the cervix on the buccal and labial sides, as far back as the second molars, was being cut. The dentist said it was a disease, and more care must be taken. The brush, with washes and powders, must be applied thrice daily. The apparently specific disease spread, in epidemic form, with both brothers. Filling was resorted to, but with little good results. It was looked upon as an incurable disease, the only remedy being brushing.

When they came to me they were frantic.

In making my diagnosis, I was satisfied, from my previous experience, that the whole trouble arose from the injudicious use of the brush and powders. They spent fifteen minutes after each meal in this work of preservation, as they

thought, and once before retiring. They seemed to have nothing to do but think of their teeth and how they should avert the calamity impending. The filling that had been done was well consolidated, and calculated to have saved from action of caries alone. But nothing could withstand such friction as had been kept up for years. The bristles did not cut the gold, but the enamel went on to destruction around the edge of the fillings. The younger brother, about forty-five years of age, had lost the six superior incisors from having been cut so far through from the labial side that they broke off; and the lower were gone so nearly to the pulp canal as to endanger them. In fact, wherever he could bring the brush into action by abrasion across the surface of all his teeth, even upon the palatal and lingual sides, the effect was evident.

I had seen many cases where the teeth had been abraded, but these surpassed all.

In making up my decision, it was necessary to determine whether there could be such a factor as disease, in such cases, or whether it was from the brush and dentifrices, with washes, &c. Some of the best practitioners had held that there was some specific action going on in the secretions of the mouth, *but had never given the crucial test to substantiate their assertions.* My own experience, hitherto, had fully assured me that there was but one cause—the *Brush* and the incidentals. I could see nothing else, in these cases, and so decided. I at once changed the whole state of affairs. Of the results of my diagnosis and prognosis I had no doubt. I selected them a small brush, and, as a powder, prepared chalk. They were directed to use the brush by simply placing it in one spot and pressing the bristles directly between the teeth with a rotation of the brush; not to rotate the wrist and brush up and down from the gums to cutting edges; avoiding the old method of drawing the brush across the teeth; not to consume more than two minutes after breakfast and supper, using powder but once daily. The denuded or abraded teeth were con-

toured with gold (Abbey's No. 5, soft,) and by hand pressure. I have seen them twice yearly, ever since 1876, and I can assure you that no recurrence or spread of the trouble has taken place in the least.

There were many such cases about that time coming to me, and I felt it a duty to construct a brush which, from the study of these phenomena, would obviate or anticipate it. While I differ with many of you, I must repeat that I *have never seen a case where the teeth had been generally eroded, but could be accounted for by friction, and nothing else.*

There is one particular form of groove that has caused so many to believe it was from disease. It seems easy to attribute it to the brush, so long as the groove is a shallow concave; but where the edge of the groove, on the side nearest the cutting edge, is an acute angle, and forming a sharp corner, the brush is not a factor. It would seem impossible to make such a shaped groove with a yielding substance like bristles. When it is carefully studied, however, one must admit it possible and certain. The brush, in nearly every case, has been driven across the surfaces of the teeth, in conjunction with powder, with a great force exerted upon the bristles, to press them upon the teeth, and produce friction. A groove, it will be admitted, is soonest made near and at the cervix by first wearing away the gum, when the bristles can touch the dentine. In many cases of rather flat teeth, the groove is lower. Sometimes not a groove, but indentation on the surface, with intervening patches of hard enamel untouched, or only partially so.

Now, when you consider how much force has to be brought to bear to keep the brush in contact with the teeth, and the brush being too wide and too long, with the bristles too close together, if a groove is made at all, then, as soon as commenced, and an edge or boundary line is made, the bristles can no longer keep on the line, but divide, and the body of the bristle—not its end or point—is constantly in friction against this line, making it at first as sharp as a

razor, and keeping it so. If you could keep the bristles on this brink of the groove, then it could not occur.

Another reason why the groove commences at or near the cervix is, that there is less resistance to the brush from the neck being narrower ; besides, there is a less body of the tooth presented. It is there the gum forms a boundary line to control the bristles, to keep them in file in their ranks, standing up squarely to their work, while those on the flatter body of the tooth go straddling around as if intoxicated. Then, as soon as the slightest groove is made, the bristles are bound like men to go in the *rut*. When the cuspids, bicuspid, and molars are the prey, you never see these grooves except close under the edge of gum, never upon their broadest surfaces. There is one phenomenon that seems not to be in keeping with this explanation and it is the unfathomable paradox to all who hold to a specific cause. How is it possible while the brush is made to pass across the surfaces of the incisors that, in addition to a groove or grooves, there should be a hill and plane surface produced ? Why not the groove, as near the cervix. This is not at all wonderful. I am quite sure that no round face tooth was ever so defaced. That it is to be found only in those cases where the enamel has given previous evidence of its surface being made up of cells of unequal value, which we so often witness ? Who has not observed the surfaces of the hardest rock subjected to the constant attrition of water, and the debris therein, cut in a similar manner, whether the grain of the rock was lying lengthwise or crosswise. Something must give way where a force is exerted ; and here, where the face of the tooth is flat and the bristles can be kept upon the surface without straddling, if one portion is softer than another there will be loss of structure irregularly. These reasons are sufficient to convince me that no other cause need be given for these phenomena. As soon as the excavated surfaces are filled and the brush used in moderation and with judgment, there will be no recurrence in any case.

You will understand from what has been said that I consider all cases where the labial, buccal and palatal surfaces are denuded, either in grooves, or when the broad surfaces of the centrals are involved near the cutting edge, it must be attributed to the brush and powders; yes, to washes also indirectly. You will never find it where a brush has not been used. The only thing answering to the specific theory is around the cervix where the brush has first worn the gum away, and caries taken the place of the brush, which latter can no longer be used without pain, and the parts are neglected. But, it is of an entirely different nature from the hard polished surfaces from attrition. While these surfaces are not so polished as those lower down toward the cutting edges, yet, they are partially so and the dentine is harder, nevertheless, it can be arrested at once by proper filling, as can all evaded surfaces, if the brush is also properly used. It matters not whether from disease or by friction, the remedy is all the same and equally effective. If it were caused by specific action nothing mechanically would avail. If I am not correct in my view and a specific cause is at work, will it make the case any better by continuing to use the brush either across or up and down? Not at all. Take for granted we know no cause for this vandalism. Can we not institute some more philosophical means of grappling with this monster? Is there a brush that has ever been in the market or in the private practice of any dentist which has any claims to a construction that will reasonably do the work for which they were designed and not cause mischief? I unhesitatingly answer, No!

What are the issues to be met? Will any one here say that, with the brushes to be had he can cleanse the teeth without producing *pressure*, and, the resultant *friction*. All will admit that, if the teeth can be cleansed, and well up under the cervical edges, without any possibility of abrasion on the enamel and lacerating or wearing away the gum, it should be the practice. Can we hope to do this with such

brushes as we are compelled to buy? It is absolutely impossible, without the greatest care and vigilance, to guard against the crosswise movement which is first learned in youth. It is kept up through thoughtlessness, the dentist, until within a few years, seldom called attention to the practice. It becomes a second nature and, when they *are* advised as to the extent of the mischief done by their suicidal hands, it is frequently too late.

Then to cleanse the teeth, *we must produce more or less friction*, how shall it be done with the least pressure upon the handle of the brush, and what style or construction shall it have? And further, shall any powder or wash be used, and if so in what form? Should a wash ever be sold by any dentist or advised? Let us look at the construction of the average brush. The handle is evidently made to allow the patient to grasp it with the whole hand; for without this, it could not be held steady with such a mass of bristles at the opposite end. Look at the arrangement of those bristles. Four and five rows in width and seldom less than two inches in length and every bundle of them in holes as close as soldiers in solid column, ranging from soft to very hard, and no allowance in quantity made for the difference in their flexibility. Did you ever for a moment stop to think that such a mass was never designed to cleanse the human teeth or those of any of the lower animals? Reflect how much pressure must be exerted on such a solid phalanx to drive them between the teeth! Should you be able to get them, there, at what expense must it be upon the gums from the direct pressure alone; and, if any movement is made to create friction, the pressure must be constantly kept up or the bristles will not, for a moment, remain, except upon the periphery of the tooth opposite the radius. You see now how in keeping the large handle is with the necessary force to be exerted from the dense column of bristles forming the apparatus designed for the end in view. How few of the bristles can be expected to reach their destination by any movement possible? The friction

of course is immense. How much of the length of the standard brush at any one time, or at all ever comes in contact with the teeth? In a word, how much material do you suppose can be dispensed with in making of a brush and be more effective? How much smaller and shorter can the handle be and give you control over the bristles while in the mouth? How much less friction can be produced for all practical purposes without so much pressure as hitherto exerted upon the standard brush? How much time can be saved? How much more pleasure can be assured? How much greater inducement, can be offered to those who now consider it a nuisance to brush their teeth? How much less risk can be guaranteed to those who know they have rather invited caries by their life-long attention than they have benefitted? How are we to please the baby and the older child and not disgust them with such an enormous mouth full of what is more fitted for scrubbing steps than human teeth. Had I not fancied I could answer all these queries in the affirmative I should not have troubled myself to tax your weary brains with the result of six years labor and observation; I cannot let the matter pass without doing what I consider a duty and a privilege.

Then, if *friction* must be produced in order to cleanse the teeth shall it be applied with a large or small brush; one thickly studded with bristles or one with them far apart in length and width? Shall it be applied crosswise or lengthwise the axis of the tooth? Shall we use powder or washes and how often and what kind?

As the teeth are of various shape and all of them with rounded faces. I claim it is impossible to use the standard brush, even once a day without injury being done to both teeth and gums. In the first place then, as we must reach all the surfaces of the teeth, I adopt a stiff bristle and set it in rows lengthwise, double the distance apart of any other brush, and only long enough to cover about four teeth. There are three rows crosswise, and the holes in the handles are drilled to make the bristles converge or lean

toward the centre, occupying but a trifling width on the face of the brush. Each row of bristles is pointed to give least resistance. The face of bristles, are again rounded from side to side to prevent them from touching the gums, before the teeth. The handle is made short and small in every way to prevent the hand from grasping it as if great force were to be exerted. It is flat to allow the tips of the fingers merely to touch it, to keep it from turning or rotating upon itself. The brush is narrower at the end or tip since the molar teeth are so much shorter than the others.

With such a brush, the teeth would soon be slaughtered if some special way of using it be not devised. *It is on just this point that all persons need to be educated.* The plan cannot be well applied with the old style brush. My theory is the ends of the stiff bristles should be simply laid on the surface of the teeth and without forcing them across, press them down upon the faces of the teeth and force the bristles between them like so many tooth-picks, pricking or piercing the particles on or between them, at the same time make the slightest rotary motion, and never, at any time enough to force them out of the spaces between the teeth. When one part is done go around the mouth on all the surfaces. The arrangement and distribution of the bristles is such that the small handle is sufficient to press the bristles home with ease and make it impossible to inflict any injury upon teeth or gums.

To still further make the friction less, the brush should be used immediately after a meal and never before, while the accretions upon the teeth are yet soft. One very light brushing at the proper moment will be the most effective.

While Brush No. 2 will cleanse the palatal and lingual surfaces well, it can be done better with Brush No. 1, which is much smaller. If I were compelled to make use of one only, I would take the smaller, No. 1.

This *new feature* of direct pressure without lateral movement, can only be done with a small brush—short and narrow, and but few and stiff bristles.

Here is where the mischief is done from having to force such a dense body of bristles on and between the teeth. This baby-brush meets the issue.

It is claimed that powders do much injury. I do not see it. Think again! The dry powder is taken upon the moistened brush and as soon as it is in the mouth the saliva floods the brush and the powder drops on the tongue, unless the brush is a very soft one. The mischief is done by the friction of the brush and not by the powder. If we must use powders (and I grant they are very excellent), let us compound them with soap, or something to "hold the powder in solution," as the druggist would say. This would be sure to keep in the brush and do execution without so much friction from the brush. I know of nothing better than the finest pumice incorporated in fine castile soap. The soap keeps the powder suspended, and, at the same time, prepares the surface of the tooth for the powder to do its work with least abrasion by removing the grease therefrom.

Shall washes be used in conjunction with a brush? I never sold such from my office at any time in my life, nor advised them. If the gums are diseased, no wash, such as is given to patients, will ever cure or harden them. The dentist should first cleanse the mouth and teeth and remove all causes for future trouble, and make one or two applications of concentrated remedies. This will suffice; at least it does with me. I can conceive of no motive in any first-class dentist recommending washes, further than from his ignorance of therapeutics, or a mere love of making sales.

I do not know that I can present the subject more clearly, except by personally demonstrating that the simplicity of their adaption is fully as philosophical as their construction; and the only improvement which I can now see, is to make them yet smaller and the bristles wider apart.

I will further state that the No. 1 is just what we want for our patent rubber and gold plates. It finds the secretions.

Now, gentlemen, I must beg pardon for brushing you up so sharply and consuming so much time over a mere tooth-brush. If I have transcended proper bounds and given you false philosophy, you now have a chance to set aside my teachings.

DISCUSSION.

Dr. Register.—I am pleased with that part of Dr. Bonwill's paper which relates to the curtailing of the brush; I believe that brushes are made too large, but it is folly to assert that they are always the cause of erosion. The reason I asked Dr. Bonwill if his brush would cleanse approximal walls by a wriggling movement, was simply to ascertain the extent of its utility, for it is these walls that we have the greatest difficulty in keeping clean. I do not think a brush can be made to thoroughly cleanse the teeth. The use of compressed air in my practice has forcibly brought to my mind how full of foul matter these interstices are, and I am now advising the use of an atomizer as excellent practice in connection with the brush and floss silk. The evolution of an acid action in an atmosphere of fetid matter takes place principally at night, in the absence of salivary irritation. I do not believe it is a free acid that robs perfect enamel of its lime salts. In using my air apparatus up to 30 to 40 pounds pressure, I am astonished at the unloading of greasy matter from the interstices between the teeth. In pyorrhea alveolaris it removes all foreign matter, so that the tissues have a chance to resume a normal condition. Any atomizer throwing an uninterrupted stream will answer. An alkali, such as lime-water, should be used with a special medication when called for.

Dr. James Truman.—Dr. Bonwill's assertion that abrasion is not caused by the tooth brush, is probably true in the sense that the constant use of the bristles over the enamel will not have that effect; but it must be remembered that powder in some form is most always used with the brush, and when used it may cut as sand cuts marble. The objection to powder, and I regard it as a serious one, is the

irritation produced upon the gums; this, while scarcely noticeable to the individual, gradually produces absorption at the gingival borders. This in time invites pyorrhea alveolaris and kindred pathological conditions. Greater care is necessary in the use of cleansing agents; charcoal will produce a blueish discoloration of the gums; tooth-picks are terribly destructive to the gum margins and pericementum. Dr. Bonwill's tooth brush No. 1, is a good idea, but neither tooth-powder or pumice should be used with it as a daily practice; the use of them should be mainly confined to rubbing with a piece of soft wood and that directly upon the accretions on the teeth.

Dr. D. Neall.—It seems to me that any process of cleansing the teeth, even by a brush of the most approved kind, which stops short of the thorough cleansing of the approximal surfaces, will be insufficient. The interstices should be kept clean by the daily use of silk thread or even cotton. A simple and small brush, with the handle and back corresponding to the curvature of the teeth, such as I now show you, and which I adopted twenty years ago, should be used. Patients should have impressed upon them that "cleanliness is before godliness"—in care of the teeth and mouth—and all agents and appliances should be simple.

Dr. Tees.—For thirty years I have daily used tooth powder with the brush, in cleansing my own teeth; my children also have used it daily since babyhood, and I fail to find any ill effects from its use. Tooth powders contain but a small quantity of gritty substances, being largely composed of chalk and orris root and but a small proportion of pumice. I do not advise the daily use of soap for cleansing the teeth; on account of its alkalinity, it acts upon the dentine in the same manner as acid acts upon the enamel. I approve of the size of Dr Bonwill's brushes.

Dr. James Truman—The idea that alkaline solutions act upon tooth structure is certainly an erroneous one. I have kept teeth in a strong alkaline solution for over a year,

without the slightest effect, either upon the inorganic or basic substance (organic). The enamel was tested by microscopic examination and the latter by decalcification and examination of the resulting tissue. The examination of mouths of persons who have made an habitual use of soap gives the same result. In regard to abrasion ascribed to the tooth brush, I must say that it has a very different origin, which to my mind has not been recognized; it is a prominent cause of caries, but has not been taken into consideration at all. I allude to the change of oral secretions from the neutral to the acid in a state of rest. It is not necessary to enlarge upon this, but I have satisfied myself by careful tests on my own mouth, that a marked acid reaction is the result of a test at this period. The lips hold the oral secretions against the labial surfaces of the teeth, and abrasion results. Antacids are indicated at night more than at any other period in the twenty-four hours, and there is nothing better than *creta prep.* for this purpose.

Dr. E. H. Neall.—In view of the fact that the saliva is frequently in a state of morbid alkalinity, a certain chalk-like decay may thus be accounted for. Dr. Taft says that alkalies will act upon the animal portion of the dentine and remove it, and in cases thus produced, the residue is friable and chalk-like.

Dr. Dixon.—I have seen teeth very much denuded in the mouth of a patient who never used a tooth brush.

Dr. McQuillen.—In my experience, I find the hardest teeth are the most denuded. I saw a patient to-day, whose teeth were badly eroded in places where the brush does not touch.

Dr. Noble.—I have seen the same discoloration of the gums, alluded to by Dr. Truman as being due to the use of charcoal, produced by some systemic cause.—*Dental Office and Laboratory.*

ARTICLE IV.

NATIONAL ASSOCIATION OF DENTAL
FACULTIES.*

The National Association of Dental Faculties held its third annual meeting in the Park Theatre, Niagara Falls, commencing Monday, August 2, 1886, President C. N. Peirce, Philadelphia, in the chair.

The following colleges were represented :

Pennsylvania College of Dental Surgery.—C. N. Peirce.

Chicago College of Dental Surgery.—T. W. Brophy, A. W. Harlan, F. H. Gardiner, J. A. Swasey, and L. P. Haskell.

Missouri Dental College.—W. H. Eames and A. H. Fuller.

Boston Dental College.—J. A. Follett.

Philadelphia Dental College.—S. H. Guilford.

University of Pennsylvania, Dental Department.—James Truman.

Baltimore College of Dental Surgery.—R. B. Winder.

Dental Department, State University of Iowa.—L. C. Ingersoll and A. O. Hunt.

Dental College of the University of Michigan.—J. Taft and J. A. Watling.

Ohio College of Dental Surgery.—H. A. Smith.

New York College of Dentistry.—Frank Abbott.

Kansas City Dental College.—C. B. Hewitt.

The following additional colleges were admitted to membership:

Minnesota Hospital College, Dental Department.—W. A. Spalding.

Vanderbilt University, Dental Department.—W. H. Morgan.

*We are indebted to Dr. James W. White, editor of *Dental Cosmos*, for advanced press sheets of these proceedings.

University of California, Dental Department.—S. W. Dennis.

Harvard University, Dental Department.—Thos. Fillebrown.

Dental Department of St. Paul Medical College.—L. W. Lyon.

Dr. Winder, chairman of the committee on text-books, reported verbally that so much opposition to the plan submitted had been expressed last year that he had concluded to let the matter rest until this meeting so as to get the views of all the schools possible. Since he arrived here he had learned that a much larger number of the profession were in favor of the idea than appeared at the meeting in Chicago. A work is being prepared under the editorial supervision of Dr. Wilbur F. Litch, but it is an encyclopædia of dentistry, and probably not what we shall require, which is a series of practical text-books. If there is a sentiment in favor of the movement to provide first-class text-books, the next thing to do is to go to work to get them up; but it is a task that cannot be hurried. Such a system of books would make the teaching in the different colleges uniform, and would put money enough into the hands of the publishers to insure the prosecution of the work. It would be a man of considerable temerity who would undertake the preparation of a work on operative dentistry, and the probabilities are that when completed the profession would have taken a step a long way in advance of its teachings. But we must have something, and the best thing we can do will be to get up the best we can.

After discussion, on motion of Dr. Guilford, a committee of five, consisting of Drs. Abbott, Winder, Ingersoll, Guilford, and Fillebrown, was elected to take the subject into consideration and prepare suggestions as to the general scope and plan to be followed in the preparation of a series of dental text-books.

Dr. Abbott offered the following resolution, which was adopted and referred to the Executive Committee:

Resolved, That a standing committee on schools be elected, whose duty it shall be to ascertain as far as practicable the workings of all dental schools in this country and Europe, and be required to furnish information to the dean or secretary of any college when desired and to report in writing at each meeting of this association.

- Dr. Truman offered the following, which was adopted:

Resolved, That the dean of each school be required to furnish the executive committee with the exact character of the intermediate examination, and whether any of them are final.

Dr. Truman offered a resolution that the winter terms of all dental colleges members of this association shall be at least seven months in duration. On motion of Dr. Abbott referred to the representatives of the different colleges with the request that they report upon it next year.

Dr. Guilford was appointed as a committee to codify the rules adopted by the association and prepare them for publication in the annual announcements of the colleges.

Dr. Fillebrown, secretary of the committee on text-books, read the report, stating that in the judgment of the committee text-books are needed on the following subjects: Oral Surgery; Dental Pathology and Therapeutics; Operative Dentistry and Orthodontia; Dental Chemistry and Metallurgy; Dental Prosthesis. Books on other subjects seem to be very well provided for at present. The report recommends that committees be appointed to solicit the writing of such books and to examine the manuscript and if found acceptable to authorize their publication, as text-books on these subjects, with the indorsement of this association; that the publication of the various books shall be under the supervision of committees composed of the professors in the colleges of this association of the particular branch of study to which the book is devoted, or such persons as the faculties may select; that the committees shall have power to solicit writers for the subjects named and to require the books to be written upon a plan acceptable to the committee and that the final copy be submitted to every

member of the committee and unless it receives the approval of at least three-fourths of the whole committee it shall not be considered approved; that each writer shall be expected to retain the complete ownership of his manuscript and to publish at his own expense and risk.

The report was adopted and the chairmen of the committees on publication were appointed, as follows: "Oral Surgery," T. W. Brophy; "Dental Pathology and Therapeutics," James Truman; "Operative Dentistry and Orthodontia," Thos. Fillebrown; "Dental Chemistry and Metallurgy," A. O. Hunt; "Dental Prosthesis," S. H. Guilford.

The following officers were elected for the ensuing year: C. N. Peirce, president; R. B. Winder, vice-president; H. A. Smith, secretary; A. W. Harlan, treasurer, Frank Abbott, James Truman, J. Taft, executive committee; Frank Abbott, James Truman, R. B. Winder, committee to decide questions arising before the next meeting.

Adjourned.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The National Association of Dental Examiners held its fifth session in the Park Theatre, Niagara Falls, commencing Monday, August 2, 1886, President J. Taft in the chair.

The following State boards were represented: Ohio, by J. Taft, H. A. Smith, and F. H. Rehwinkel; Illinois, by Geo. H. Cushing; Michigan, by A. T. Metcalf, F. W. Clawson, and G. S. Shattuck; California, by S. W. Dennis; Pennsylvania, by S. H. Guilford, W. E. Magill, and E. T. Darby; New Jersey, by Fred. A. Levy; Iowa, by J. T. Abbott; Maryland, by T. S. Waters; Louisiana, by Joseph Bauer; Indiana, by S. B. Brown; Wisconsin, by Edgar Palmer.

Officers were elected for the ensuing year as follows: J. Taft, president; H. A. Smith, vice-president; F. A. Levy, Orange, N. J., secretary and treasurer.

ARTICLE V.

CARE AND TREATMENT OF CHILDREN'S
TEETH.

BY LANGDON S. CHILCOTT, D. D. S., BANGOR, ME.

(Read before the Florida Dental Association.)

In response to your President's very polite invitation to contribute a paper to be read at your convention, I select this subject—not because I expect to present any new ideas, but as it is one of practical importance, and given very little thought by most parents and very many dentists, and one which will, at least, have a brief review.

In treating these young patients, it is first necessary to have the co-operation of the parents, or whoever may be most interested; for only by such help can we depend on the fulfilment of our instructions.

Surely, we can do nothing in our practice that will be of more permanent good than to establish principles of cleanliness with our young patients in regard to their teeth.

As soon as a child has teeth, it should be the daily duty of the mother to care for them, seeing that perfect cleanliness is maintained, and as soon as practicable, teach it a judicious use of the tooth brush, floss silk and tooth-pick, and provide it with a suitable dentifrice.

Thus, early becoming habitually attentive to the teeth, it will not feel comfortable unless they are cleaned after each meal.

Too much care cannot be taken to see that the teeth are properly used and not injured at meals, as mere ornaments, by bolting the food without properly masticating or making an emulsion of it, as is done in some cases, by drinking water or milk, or what is worse, tea or coffee with almost every mouthful. Evil effects, caused by soaking the

food in this way, and preventing a proper mixture of saliva, are too well known to more than mention here. It seems to be a principle of nature not to maintain anything for which it has no use, and it certainly looks reasonable that if we disregard the use of the teeth, especially the temporary set, nature will not endow the permanent in their formation and development as it otherwise would.

It cannot be expected by hygienic treatment to build up a fine denture where there is a predisposition to decay, but I believe much can be done for the permanent set and for the teeth of succeeding generations, by *caring for* and *using* the temporary sets of the present.

Those people who delight in talking of their experience in the dental chair, and for the sake of representing themselves as martyrs, by giving in magnified detail all the pains they have endured, and describe the horrid instruments and "piles of appliances" which, *they say*, they have seen and felt in the office of their famous dentist, make an irreparable mistake when they indulge in conversation of this nature before children, for their little ears are wide open to everything that is said, and it cannot fail to create a fear that will, when they visit their dentist, be distressing to themselves and perplexing to the operator.

It would be a mistake to deceive them with the idea that they will enjoy the dental chair.

Let mothers see to it, then, that their children are not intimidated, so when they are taken to the dentist (which should be as early as the second year, and earlier if the teeth show signs of decay), they may go with as much unconcern as possible. As the temporary teeth are only intended to last a brief period, it is argued by many dentists that it is not worth while to give them any attention more than to extract an offensive one when it causes pain. Such teachings and practice are wrong, and cruel to the children, and, I am glad to say, are fast being buried in the cemetery of dental antiquities.

In asserting that sufficient care and treatment should

be given the temporary teeth to assist them in maintaining their places their allotted time, I am aware I stand in direct opposition (to his patients, at least), of a certain well known dentist, yet this same man is *Professor of Operative Dentistry* in one of the best dental colleges in this country.

I hope I am not too presumptuous in denouncing the practice of some of my senior brethren, but believe that if one is to err on this subject, it may not be by saying too much.

To ensure success with children, it is of the greatest importance to gain their confidence, and when this is accomplished the battle may be considered won. The only way to hold such hard earned ground is to deal squarely with them. That stale lie, "it won't hurt," and the forcep up the sleeve, are passai. Victims of this old-fashioned "funny business" are those who hate to have their teeth even looked at.

Handle the children, then, with all possible gentleness.

Better, by far, insert a very temporary filling that must be replaced in a few weeks, than to thoroughly excavate and fill a very sensitive cavity in one of these small teeth.

Oxyphosphate of zinc, gutta percha, amalgam and tin, are the materials best adapted to the filling of temporary teeth. The operator must be governed by conditions, which agent should be employed, bearing in mind that the relatively large pulp must be protected from thermal changes, and fillings for large crown cavities must be able to resist the force of mastication as well as a poor conductor of heat. As less pain is caused by excavating a cavity when dry, this condition should be maintained as much as possible, but as such operations are usually brief, and it requires so little time when everything is ready to fill the cavity, the napkin and bibulous paper, in most cases, is sufficient. I have never yet found it necessary to apply rubber dam to a deciduous tooth.

In cases of an exposed pulp, a pellet of cotton, saturated with creosote, and placed in the cavity, carefully sealed, allowing it to remain in a few days, is all that is required.

After the devitalization of the pulp has been accomplished, as much of it as possible removed, its cavity filled with crude cotton saturated with creosote, or carbolic acid, and the crown filled with any material that will insure cleanliness, no further trouble need be expected from that tooth during the time it should remain in the mouth.

When a deciduous tooth, with a dead and putrescent pulp is presented for treatment, the first step is to open the pulp chamber freely, and if, after allowing it to remain long enough for the soreness to entirely disappear, it promises to be comfortable, the pulp cavity may be disinfected and the tooth filled with any material that may be best adapted to the case; if not, it is best to remove all decay and enough of the crown to make it clean, then let it alone.

I would at once extract a filthy, abscessed root, or one that could not be easily put and kept in a comfortable condition.

But I would prefer all roots to remain in position their appointed time; not for fear of any change of shape in the jaw by their premature loss, but if the roots are not absorbed, by extracting them at the proper time, it is much easier for the new tooth to struggle to the surface.

The sixth year molar, although belonging to the permanent set, in its treatment before the twelfth year, comes in, properly, with children's teeth.

As soon as decay is seen, the cavity should be excavated and filled, so the tooth will be comfortable, and in *all cases* this tooth should be retained until the eruption of the second molar may be expected, when its destiny can best be determined by an intelligent dentist.—*Southern Dental Journal*.

Editorial, Etc.

THE SOUTHERN DENTAL ASSOCIATION.—The eighteenth annual meeting of this Association was held in Nashville, Tennessee, July 28th, 29th and 30th, 1886, and was not only largely attended, but was one of the most interesting sessions ever held. The president, Dr. Wardlaw, of Augusta, Ga., in his address referred as follows to associative effort:

"I wish here to say, that in my estimation, no one instrumentality exerts more potent influence in promoting the dignity of our profession than these association gatherings.

Associative effort seems to be the characteristic feature of this day of progress. Everywhere and on all sides we have associations and conventions—agricultural, commercial, scientific, literary and religious.

Man is a gregarious animal. No one lives to himself. We cannot stand alone. We are mutually dependent. Independence is a myth. Even our every word is learned from, and belongs to, some one else.

Originality is a scarce article. All of our ideas are evolved from those of others. We may pride ourselves upon the conceptions of our fertile brains, but a strict analysis of our mental processes would reveal to us the thoughts of other minds disguised in the habiliments of our own words. There must be a reciprocity of ideas, methods and experiences and here we have it.

As natural fruits of our association, I mention laws regulating the practice of dentistry, State examining boards, the national association of dental examining boards and the national association of faculties of dental colleges, all exercising a reciprocal influence upon education, that foundation stone

upon which our professional edifice should stand. The laws gave us our examining and licensing boards. As their usefulness increased, and their functions enlarged, the State boards realized the importance of co-operation and correspondence of action, and hence was evolved the "Association of Examining Boards." These boards, National and State, exerted such marked influence upon the colleges, as to cause them to advance their standards and leagues together in their "Association of Faculties."

This is the direction in which this good work should go on. Let our boards year by year, systemize their plans and perfect their workings until they are in entire accord and harmony with each other, and until a license issued in one State will be of binding force in all the States and the diplomas of all the colleges will be received with respect and authority wherever presented.

Having reached this point we will be prepared to take the grand culminating step which will place us clearly in the lead of the medical profession. I mean, and this is the point, if point it has, of my address, that the dental profession should confer upon its worthy students a national degree which should subordinate or abolish the various degrees of D. D. S., D. M. D., L. D. D., etc., and be analagous in rank, reputation and dignity to the great English degree, "Fellow of the Royal College of Physicians." This is the great desideratum to which we must direct our efforts, but of which I haven't time to say more now. It may be unknown to some here, that we are even now, leading the medical fraternity in matters of law and education. Almost nothing is being done by it in these directions."

The editor of this JOURNAL received the following very complimentary notice in the *Daily American*, of Nashville, report of the proceedings:

"All of the meetings of the body will be open to the general public, and all physicians and dentists in the city will meet with a hearty welcome. There will be present a number of men who have distinguished themselves and added lustre to their profession. One of these is Dr. F. J. S. Gorgas, Dean of the Dental Department of the University of Maryland. He

is one of the oldest dentists in America and is the honored author of many well-known text books."

A communication from the National Association of Dentists inviting a reciprocal committee to confer for future closer relations between the two bodies was with one voice firmly, but respectfully rejected.

The following officers were elected for the ensuing year, the next meeting to be held at Old Point Comfort, Va.

W. W. H. Thackston, of Farmville, Va., President; B. H. Catching, of Atlanta, Ga., first vice-President, Rollo Knapp, of New Orleans, La., second vice-President; W. H. Richards, of Chattanooga, Tenn., third vice-President; J. Y. Crawford, of Nashville, Tenn., Corresponding Secretary; Louis P. Dotterer, of South Carolina, Secretary; H. R. Lawrence, of Athens, Ga., General Treasurer. Executive Committee—J. B. Woodley, of Norfolk, Va., J. H. Moore, of Richmond, Va., and E. S. Chisholm, of Alabama.

THE AMERICAN DENTAL ASSOCIATION.—This Association held its 26th annual meeting at Niagara Falls, commencing August 3d, 1886, with the following "bit of facetiæ," in the presence of some two hundred members:

"Gentlemen, the hour has arrived when in my official capacity it becomes my pleasing duty to declare this convention formally opened," said Dr. W. C. Barrett, the president, as he advanced to the front of the Casino stage and raised his hand to silence the conversation in progress among the dentists assembled in the handsome auditorium.

"I call the president to order," rang out the sharp tones of Dr. George W. Keely, of Oxford, O.

The startled presiding officer glanced with a puzzled air of interrogation in the direction of the erect form of the treasurer, who stood with folded arms as calm as the Sphinx.

"No one has a right to call the president to order," continued Dr. Barrett after a long pause for explanation. "The gentleman from Oxford may rise to a point of order."

"I rise to a point of order," in the same cold, stern tones.

"State it," with fierce emphasis.

"According to the rules of this association no one has a right to put in his gab until he has paid his dues."

The presiding officer, who had been so busily engaged in other matters that he had forgotten the little financial formality, reddened, then joined heartily in the laugh at his expense, and quickly transferred a five-dollar greenback from his vest-pocket to the treasurer's drawer.

The twenty-sixth annual meeting of the American Dental Association was opened in the very town where over a quarter of a century ago the society was first ushered into being. Without exception every member present bore the unmistakable stamp of a gentleman. Calm, self-possessed and perfectly at ease, with that confident air which always characterizes those who approach the other members of their race from a vantage point, they formed a fine deliberative assembly, gathered from the four quarters of the United States to discuss the underlying principles and peculiar problems of their calling.

The exhibits of dental specialties and supplies included nearly everything pertaining to the preservation of the teeth. The Casino building was well adapted to this purpose, inasmuch as the main auditorium is nearly surrounded by wide corridors, music rooms and other apartments convenient of access and well lighted. The most elaborate display was made by the S. S. White Dental Manufacturing Company, of Philadelphia, said to be the largest establishment of the kind in the world. Upon four long tables were spread out bushels of artificial teeth properly classified, forceps in a hundred divers forms, drills, gouges, burs, burnishers and all the other instruments used in the filling process, the apparatus used in the manufacture, storage and administration of laughing gas, appliances for the manufacture of sets of artificial teeth, and in short everything pertaining to dental science. The company was represented by Dr. James W. White, the president, T. A. Long, the general traveling agent, and several assistants.

The second exhibit in point of size was that made by the Buffalo Dental Manufacturing Company, Dr. T. G. Lewis and Charles A. Rother in charge. They showed a complete line of dental goods, including many ingenious specialties which are handled exclusively by this company. The new asbestos heater

shown on their table was much admired. A gas flame from a special form of cylindrical burner streamed up against a perpendicular fibrous surface of asbestos which is immediately transformed to a glowing mass which radiates the heat instead of permitting it to ascend in a current from the burning gas. This form of heater is excellent for a small operating room, while when set in a carved fireplace it forms an excellent substitute for a glowing grate.

The Florence Manufacturing Company, represented by G. A. Wells, exhibited some new forms of tooth-brushes. The prophylactic brush by means of the curved handle, the tapered end and the contour of the bristles, will reach every exposed portion of the teeth as no other brush can, while the dental plate brush seems to be the only kind which will perfectly clean a plate. The other exhibitors were H. D. Justi, Philadelphia, artificial teeth and specialties; Seabury & Johnson, New York, dressings and absorbents; Welch Dental Company, Philadelphia, English artificial teeth; the Wilmington Dental Manufacturing Company, specialties; Gideon Sibley, Philadelphia, artificial teeth; American Dental Company, New York, dental specialties; Cutting & Delaney, Buffalo, carved woodwork, and C. A. Timme & Co., Hoboken, N. J., gold foil and cements for filling.

Monthly Summary.

A DISAGREEABLE ACCIDENT CONNECTED WITH THE EXTRACTION OF A TOOTH.—*By Hartman, Dentist, Barmen.*
—A few days ago a man called and requested me to remove the left wisdom tooth of the lower jaw. For loosening those teeth I am in the habit of using the lever of *Lecluse*, and taking my position as far as the operating chair permits, in the front

of the patient. The tooth did not yield to a slight pressure; applying a stronger one, I sustained from the man, with his right leg, such a kick upon my knee, that a quick and vehement movement on my part was caused and the tooth broke off. But the patient did not spit out the crown of the tooth, and besides I could not discover any trace of it in his mouth. The patient having cleansed his mouth from blood, by rinsing it repeatedly, asserted that he felt something sharp in his throat, which was exerting pressure, and incited coughing. The mouth being meanwhile thoroughly cleansed, I looked into it more closely, and discovered the crown of the tooth imbedded in the (velum palati) soft part of the palate, presenting its masticating surface to me. With a pair of pincers I cautiously removed the fragment, and found a small quadrangular hole in the soft palate, corresponding to the form of the tooth. The tooth was broken off by the false pressure I had involuntarily exerted with great vehemence, it had turned over, cutting out with its sharp edge, a piece of flesh. Thus it had exercised a similar effect, as when a pistol-ball is shot through a window pane.

I had to let the man withdraw, without doing anything more, as he would not submit to my adopting any further treatment. He did not keep his promise of calling again, so I am not aware of what has become of the hole in the velum. I publish my accident with the object of admonishing practitioners to exert great caution in the use of the lever.—*Deutsche Monatsschrift für Zahnheilkunde.*

ALL PORCELAIN CROWNS AND BRIDGE WORK.—*By E. Parmly Brown, D. D. S., Flushing, N. Y.**—The era of removable artificial dentures is soon to pass away—excepting in rare instances, and for the very poor. The development of tooth filling to a state of great perfection is nipping caries in the bud. Badly decayed teeth are being crowned with porcelain and gold crowns, preserving them better at that advanced stage of injury than the former practice of filling, not speaking of the greater art in the practice where porcelain crowns are

*Read before the Dental Society of the State of New York, May, '86.

used, and the saving of nerve force and time to both patient and operator.

The total loss of from one to ten teeth on a single jaw is being remedied by permanent fixtures that, I am anxious to be put on record as saying, are in five important respects better than the removable dentures of metals and plastics that are commonly used for the purpose:

Higher art can be attained—greater strength.

As perfect cleanliness as the natural teeth at their best.

A more normal condition of the tissues of the mouth than with plates that cover the mucous surfaces.

Far greater comfort to the wearer, with an ability to masticate the food only excelled by the natural teeth themselves in a good condition; the taste not being interfered with by the roof of the mouth being wholly or partly covered as with upper removable dentures; the remaining teeth not being injured one quarter as much with the permanent fixtures as with removable plates.

And last, the great satisfaction the patient expresses in not having a movable artificial plate in the mouth.

These are strong assertions some of you will say, but they are more than assertions. They have been demonstrated to my entire satisfaction by several years practice, and I am ready and anxious to demonstrate them to you, and prove each and every one of the claims I make as you may demand.

The all porcelain crowns and bridge work invented and practiced by me is the kind of work I refer to, and the only kind that will bear me out in the assertions of greater truth to nature, greater cleanliness and greater strength.*

Let the better element in the profession hail with delight any changes that lift us out of the slaughter-house, tooth-pulling era of the nitrous oxide gas introduction.

Let them hail with delight any changes that lift us above the mule-driving, hod-carrying ability necessary to construct the five dollar rubber set of gum sections, that usually looks like a white picket fence around a cemetery plot.—*The Odontographic Journal*.

*Specimens were exhibited and described.

THE DESTRUCTIVE ENERGY OF THE TINCTURE OF THE CHLORIDE OF IRON ON THE TEETH.—An original paper of conspicuous merit with the above title was read before the New York Odontological Society, by George W. Weld, M. D., D. S.

As the researches of Dr. Weld in this direction possess many points worthy of the careful consideration of every dentist and physician, the salient features of the paper are cheerfully published.

Dr. Weld declares that clinical observation shows that water increases the destructive energy of the tincture of the chloride of iron upon the enamel of the teeth more than any other fluid, and as an illustration he states that the effect of adding water to a simple solution of the chloride of iron, *devoid of free acid*, is to give basic salts of iron and the separation of free hydrochloric acid.

Dr. Weld showed conclusively that the tincture of the chloride of iron of the official strength had but little, if any, effect upon the enamel structure of a tooth, when immersed in the same for a period of twelve hours, but that when immersed in a solution of the tincture and water in proportion of one ounce of water to one drachm of the tincture, the enamel was materially injured in five minutes.

As an illustration of this phenomenon the Doctor stated that, when a piece of zinc is immersed in strong sulphuric acid (H_2, SO_4), it has been observed that the acids has no effect upon the structure of the zinc, but if a little water be added to the acid the zinc is at once destroyed. So that it is not entirely a matter of the strength of the fluids, so far as the quantity of iron or acid is concerned but a matter of constitution or solubility.

The zinc in the strong sulphuric acid is protected in the same manner that the tooth which is immersed in the strong tincture of the chloride of iron is protected, viz: The surface is blackened up with the basic salts of iron insoluble in alcohol, and which prevents chemical action. In the case of the zinc it is the sulphate of zinc resulting from the first action, and insoluble in the concentrated acid, that forms a protecting coat over the surface of the zinc; the addition of water dissol-

ves this protecting sulphate, and renders further chemical action possible. In the case of a tooth immersed in the strong solution of the tincture a similar action takes place, viz: the oxide of iron first formed protects the enamel from immediate chemical action on account of its compact adherence to its surface.

To illustrate still further, Dr. Weld called attention to two specimens of teeth on the card* which had been immersed in the tincture and alcohol, and compared them with teeth which had been immersed in the tincture and water. Here it was observed that although the alcoholic solution used contained the same quantity of the tincture and possessed apparently the same relative strength and immersed for the same length of time, yet no injurious effect was produced on the lime-salts of the teeth. The reason is attributed to the fact that alcohol is a dehydrating compound and that the peroxide which is formed in the alcoholic solution is of the anhydrous form, and in character very compact, adhering closely to the surface of the tooth, thereby preventing immediate chemical action, whilst on the other hand, in the presence of water the peroxide† which is precipitated is the hydrated form and flocculent in character, does not so well adhere to the surface of the tooth, leaving the free hydrochloric acid in the solution to unite with the lime-salts with greater facility.

There appears then to be two forms of the peroxide or iron, viz: (1) The hydrated form $(Fe_2(OH)_6)$ formed in the water solution, which is flocculent and non-protecting to the teeth. (2) The anhydrous form $Fe_2(O_3)$ formed in the alcoholic solution, which is heavy and compact, and protects the surfaces of the teeth.

The following formula will show how the hydrated peroxide is formed from the anhydrous peroxide: $(Fe_2 O_3 + 3H_2 O = Fe_2 (OH)_6)$.

The teeth immersed in an ounce of the elixir of the pyrophosphate of iron with one drachm of the tincture of the

*A glass case presented to the Odontological Society containing sixty-four teeth, showing, with various modifications, the destructive energy of different acids and iron compounds on the enamel.

†Synonyms: Ferric Hydroxide. Hydrated sesqui-oxide of iron.

chloride added for a period of twenty-four hours, produced apparently no chemical effect on the enamel; but with the same quantity of water and the tincture the enamel was completely destroyed. The elixirs are composed of nearly twenty-five per cent. of alcohol, the presence of which, as observed in the strong solution of the tincture, and in the alcoholic solution, affords a protection to the enamel of the teeth in the manner described. But it is to be noted that when a tooth is immersed in a solution of the tincture and simple syrup, in the above proportions, the enamel is but little affected. This is due to a mechanical reason or a condition of fluidity of the solution, i. e., the presence of the sugar in solution coats the surface of the enamel, preventing the chemical affinity between the acid, or perchloride of iron, and the lime-salts in the teeth.

The manner in which syrup modifies the destructive energy of the tincture on the enamel was beautifully illustrated by the effect produced on the specimens of teeth which had been immersed in a weak solution of phosphoric acid, viz. "Hosford's acid Phosphate," "Phos-acid," and "Phospho-Muriate of Quinine Compound." The first two of these proprietary medicines are water solutions, and the effect is to destroy the enamel of a tooth in an hour, whilst the last one, which is a syrup solution (each fluid drachm containing two grains of free phosphoric acid) produces but little, if any, injurious effect on the enamel in twenty-four hours.

Equally interesting was the effect produced on the enamel of the teeth which had been immersed in a solution of the tincture and the weak alkaline waters (notably Vichy.)

When a drachm of the tincture is added to an ounce of Vichy-water, a slight effervescence occurs, indicating that the bicarbonate of soda contained in the water has neutralized a part of the free acid contained in the tincture; in consequence, when a tooth is immersed in such a solution, the destructive energy of the iron is to a great extent modified. Unless the specific nature of the tincture of the chloride of iron is materially affected (and the peculiar odor of the tincture remains) there seems to be no reason why this preparation of iron, at least in all cases of anæmia, should not be administered in combination with Vichy-water.

There are then three menstrua which may be employed to modify the destructive energy of the tincture of the chloride of iron on the enamel of the human teeth. The first is alcohol in some form. The second is Vichy-water, which neutralizes to a slight extent the free acid contained in the iron. And the third is some form of an elixir or simple syrup.—*Odontographic Journal.*

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ARTICLE I.

SOUTHERN DENTAL ASSOCIATION.

EIGHTEENTH ANNUAL MEETING.

AT NASHVILLE, TENN., JULY 27, 28, 29, AND 30.

(Reported by Mrs. M. W. J.)

The eighteenth annual meeting of the Southern Dental Association was held in Nashville, Tenn., in Watkins' Institute.

The meeting was called to order on Tuesday, July 27, at 10:30 A. M., by the President, Dr. W. C. Wardlaw, Augusta, Ga.

The following officers were present:

President, Dr. W. C. Wardlaw, Augusta, Ga.

First Vice-President, Dr. B. H. Catching, Atlanta, Ga.

Second Vice-President, Dr. J. R. Knapp, New Orleans.

La.

Corresponding Secretary, Dr. E. S. Chisholm, Tuscaloosa, Ala.

Recording Secretary, Dr. R. A. Holliday, Atlanta, Ga.

Treasurer, Dr. H. A. Lowrance, Athens, Ga.

EXECUTIVE COMMITTEE.

Dr. W. H. Morgan, Nashville, Tenn.

Dr. G. F. S. Wright, Columbia, S. C.

Dr. W. H. Richards, Knoxville, Tenn.

The meeting was opened with reading from the scriptures, and prayer by the Rev. I. D. Barbee, Nashville, Tenn.

The minutes of the last annual meeting, held in New Orleans, March, 1885, were read and confirmed.

Dr. Prewitt welcomed the association in behalf of the Tennessee Dental Association, and the local interests.

ADDRESS.

Gentlemen of the Southern Dental Association :

It has been made my pleasant duty to welcome you in the name of the Dental Association of the State of Tennessee.

First, I desire to acknowledge the honor conferred upon me, and my inability to fitly convey to you by word, the sincerity of that welcome. I am happy to know, however, that there are to you other evidences of your welcome than the words of the representative of the State Association.

While it has never been my pleasure, nor that of a number of gentlemen present, to meet with you in association capacity, yet you are no strangers to us. As a body of investigators, and as an educator, in so far as associations are educators, we regard you as second to none; though it may be less pretentious, possessing merit without assumption—seeking to spend and be spent in the upbuilding and advancement of that profession which, next to the wife and little ones, you love most.

Upon your rolls are the names of those whose reputations are not confined to any section, but whose names are

familiar to the profession in every clime. There are those here who were at the forming of this association, still active and aggressive ; some who took passage when the ship was full rigged, and some who did but yesterday, as it were, enlist among you. Still, there are others, standing ready with credentials regularly made out, and waiting impatiently for permission to be numbered with you. To all we say, you are welcome.

True it is, that you have all, doubtless, expected an address of welcome, whether you were really welcome or not. In these piping times of peace, when all seems going as merry as a marriage bell, it is but a part of every programme—it is taken as a matter of course, that upon all occasions like the present, some gentleman will, with glittering speech and well-rounded sentences, after the fashion of form say: "You are welcome."

We would make you know, beforehand, if language were not so poor, what you can know only when you are gone; you come well, in that your coming promises not only a flow of soul, but a feast of reason.

You have lived, may be, for months, in the happy anticipation of this pleasant re-union, when you would shake hands with your brothers, and enjoy again that social intercourse which these meetings invariably develop. Nor is that all; you have been stowing away incidents of interest for this meeting, and have been plying with all your might the principles of science to every branch of the profession, that you might present matters of interest for the consideration of this body. That the strides made by the profession in the last quarter of a century are giant ones, is no argument that there are not yet many such to make; and to you the profession, as well as the people of your section, especially, are looking as a body of representative men, to perfect, as far as possible, methods, theory and practice.

I forget, however, that it is no part of my business to direct, or even forecast the deliberations of this body, but only to tell you, if I can, how welcome you are.

In that you are, in some manner, the guests of the Dental Association of the State of Tennessee, you are welcome. In that you come, a body of representative men of the profession, by dint of study, application and experience, prepared to discuss and demonstrate from every standpoint, matters of greatest interest to the dentist and his patient, you *come well*.

We rejoice, that while this word of greeting has been made to do duty under so many varied circumstances, yet on no occasion has it been intended to be more heartily employed. Except when used in *hollow form*, no word, perhaps, expresses more. None but the brave officer who cried in the agony of his soul when the fortunes of Waterloo were trembling in the balance: "Would to God night or Blucher would come!" can ever know how *welcome* either would have been.

When Cæsar had received from Brutus' arm, nerved by ingratitude, the fatal stab, he ceased to struggle, and, with the words: "Et tu mi fili," he wrapped himself in the more than royal robes of Rome, reeled, and fell at the foot of Pompey's statue, *welcoming death*!

Not till the Peri had brought a sigh of repentance was the gates of Heaven thrown wide open, and he *welcomed in*. Expressive, beautiful comprehensive, take it in its most expressive sense; and it is thus we mean it. Make the most beautiful application of it, and it is thus we would apply it. Make the broadest and most comprehensive use of it, and you have used it as we would.

While we welcome you, we know it is to work as well as pleasure, and it may be well for each to ask himself the question:

"Why all this toil, for triumphs of an hour?

Life's a short summer, man's a flower;

By turns we catch the vital breath and die;

The cradle and the grave, alas, so nigh!"

Why am I here? For what? Is it that this meeting may better prosper and fit me to serve my patients? Have

I in view the betterment of the condition of my fellow-man? Is it that by contact with the better element of the profession my views may be broadened, my capacities enlarged, my zeal increased? If so, then there should be no drones in this hive, but each one should contribute his mite, and he who feels himself not a good talker, or has nothing to say, let him see to it that he proves himself a good listener, and that he can watch as well as pray.

In conclusion, and in view of the very sacred and intimate relations existing between the dentist and his patient, and in view of the further fact that in the profession since this body last met, death has dealt his shafts both right and left, and whole battalions lie afield, it may not be out of place to admonish and remind one another to

"Make then, while yet we may, your God your friend,
Whom Christians worship, yet not comprehend.
The trust that's given, guard, and to yourselves be just;
For, live we how we may, *die we must.*"

Again we say, you are welcome.

Dr. G. H. Winkler, Augusta, Ga., responded in behalf of the Southern Dental Association.

He expressed his gratification at being made the mouth-piece of the Southern Dental Association; his appreciation of the kindly sentiments expressed, and of the general welcome tendered, which was only equalled by the gratification of accepting the same. He spoke of the giant strides made by Nashville; an advanced civilization, due to her men of energy, zeal, and capacity, whose hands had been upheld by women clothed in the purest of all womanly attributes. He spoke of her commerce, of her railroad facilities, her factories, founderies, and machine shops; her educational institutions; of her magnificent state house; of her numerous asylums; of her daily, weekly, and monthly publications, which are models of literature; of the spires and domes of her many churches, proclaiming a God-fearing people, concluding with the hope, that in justice to Nashville, every member of the organization would put forth his best ener-

gies, and all combine to make the eighteenth annual meeting the most memorable in the annals of the association; binding closer the ties of fraternal intercourse, inspired by good thoughts and noble deeds.

The President requested that the names of applicants be now handed to the Executive Committee, and voluntary essays to the Secretary. He tendered a welcome to the dentists of the city, to members of the medical fraternity, to the ladies present, with the hope that they would come again.

At the suggestion of Dr. E. S. Chisholm, the students of the various educational institutions were also included in the welcome tendered.

After a brief recess for the payment of dues, the society was called to order again, and Dr. B. H. Catching, Atlanta, Ga., in a few well chosen words, introduced the venerable Dr. W. W. H. Thackston, of Farmville, Va., the oldest living graduate in the profession; the only survivor of the second class of the Baltimore College of Dental Surgery.

In response, Dr. Thackston, as delegate to the association from the State Society of Virginia, spoke as follows:

DR. THACKSTON, OF FARMVILLE, VA.

Fourteen years ago, upon the banks of the "James," in a city setting upon her "seven hills," and looking mournfully down upon her battered walls and ramparts; upon her crumbling ruins, and upon the graves and monuments of her illustrious dead, it became my duty, as it was my honor and pleasure, to welcome you to all that was left of that grand old city, and to all that remained of that grander "Old Dominion," to her wasted homes, to her broken altars, to her humble hearth-stones and to her hospitable roof-trees; but amid all her wreck and ruin, to hands as clean, to hearts as warm, and love—love as pure as bannered knight, or crested cavalier ere dared maintain in "tented field," or glittering tourney.

The years have come and gone, and gone are some

whose hands we then shook and clasped in the fond hope that we should meet again. Some who faithfully shared your every burden, who rejoiced in all your triumphs and who justly and worthily wore your proudest honors, and now and here, under the dispensation of a benignant Providence, I meet you again upon the banks of another beautiful river; in a young, a populous and flourishing city, instinct with life and energy, busy and prosperous, teeming with commerce and traffic, decked and crowned with marts of trade, with temples of art, with temples of science and temples of worship; and here in this honored and august presence, amid these grand and imposing surroundings—in this hall—I bring you once more the greetings, the salutations, the all-hail of that same "old mother" who still regarding you as, in a large degree, her own social, political and professional offspring, repeats the proud exclamation of the Roman matron when pointing to her children, "these—these are my jewels."

And, now, what shall I say in acknowledgment of the reception who have accorded me and my honored colleagues? What offering could I lay upon your altar worthy your acceptance and commensurate with your kindness?

It would be vain and presumptuous to essay the role of teacher, for you are adepts and experts in art, and proficient and scholars in science; you are not only my peers, but my masters. I bring you no new "dispensation," and can unfold for you no late "revelation;" I have solved no hidden problem, and can make no grand and imposing contribution to your stores of knowledge. Why then, you may ask, am I here? and I will answer: To meet you "face to face, to look into your hearts and to show you my own, to shake hands and touch elbows, to labor with and learn of you—for you can tell me what I never heard, and teach me what I never knew."

I am here with my honored colleagues as the joint bearer of the salutations and benisons of our "State Asso-

ciation ; " here not only to greet you fraternally, but to tell you that we feel a pride in this federated organization, which is the legitimate outcome of the State Associations that Virginia was the first to establish and incorporate ; to say that we recognize and honor you as the " upper House," as the Dental Senate of the South, and also to fling wide open our gates, our hearts and homes, and ask that you will once more honor the " Old Dominion " as your place of annual assemblage.

And in addition to this delegated and representative duty, there were personal considerations and attractions that irresistibly drew me hither. I desire once more to take counsel and compare notes with " old friends," and to meet and make friends of the young and rising representatives of our profession in the South and West ; the men around whom cluster the fond and proud hopes of that bright and promising future to which our hearts and eyes are turned:

I desired to commune, and possibly for the last time on earth, with some of those who, in " days lang syne," trod with me the stony paths of our " wilderness," who tasted with me the " bitter waters " of our professional " march ;" and notably of these : Dr. W. H. Morgan, the honored dean of Vanderbilt, who, with strong arm, with dauntless courage, and with abiding faith, for forty years has " smitten the rock," and who now beholds flowing around him the sparkling, crystal streams of a science no longer desecrated and repudiated, but recognized, respected, honored and taught in our " groves and academies," our colleges and universities, and more than that—*practiced* with a profit and beneficence to society that distinguishes no other era in our professional history. Thank God ! this grand old man has been spared to see the seed he helped to plant in this virgin soil, germinate, grow and bud, and blossom, and at last bear fruitage to his labors, and we can only say may he " rest under the shade," and his declining years be sheltered, fanned and refreshed by the foliage he has so faithfully nurtured, and pruned and trained.

Another strong attraction, Mr. President, was your corps of Southern and Western editors and journalists—the gentlemen, not of our “*fourth*,” but eminently of our “*first estate*,” the gentlemen who spread our monthly and quarterly feasts and banquets, who trim our sails, who stand at the helm and navigate our barques; they who dress our thoughts and clothe our ideas, and shed upon our pathway the meridian light of this wonderful day of progress and professional development.

For these reasons and considerations I have left my home, have deferred pressing duties and obligations to accompany my fellow delegates, and be with you to-day. And, now, I will only trespass upon your time and attention to again thank, and tell you that I shall cherish this occasion and the reception you have accorded me, as one of the ever bright and green spots in life's long journey; as the fulfillment and realization of my highest aspirations and as a princely recognition of my claims to your consideration.

And, now, in closing this reply to the knightly, courteous and fraternal introduction I have received, I shall presume upon your kindness, and beg an humble place in your ranks while we are together, and a small niche in your breasts when my life's work is over, and I have become to you—and to all—a memory and a shadow.

The President, Dr. W. C. Wardlaw, delivered his annual address.

PRESIDENTIAL ADDRESS.

Gentlemen Southern Dental Association:

In discharging this constitutional duty which your kindness has devolved upon me, I desire to address you a few thoughts upon the relationship of dentistry to the science of medicine.

Is dentistry a distinct profession, or should it be regarded as a specialty of medicine? In royal old England, so conservative of customs and so jealous of dignity, the latter claim would not be allowed, but in democratic America, a more liberal sentiment obtains, and such a relation is gradually being accorded.

In England to-day, the College of Physicians, those mighty men of powdered wig and gold-headed cane, frown down "specialists," even in surgery, and the business of the apothecary, and their conservative instincts still protest against "specialism." The battle is even now raging there, with victory smiling on "specialism." As it is conceded that America has been the leader of England in most matters pertaining to dentistry, we may hope that in this instance, too, she may succeed in breaking down some of these conventional barriers standing in the way of progress.

Our claim is, that whilst dentistry is a distinctly organized profession, made so by peculiar circumstances, it is, properly and really, a "specialty" of medicine, being, at the same time, a science as well as an art, and should be so recognized and encouraged. The medical fraternity generally are disposed to regard it as only one of the arts, with a slight admixture of medicine.

Medicine, in the present acceptation of the term, is very comprehensive, and signifies all that pertains to the prevention, alleviation and cure of disease, being conveniently divided into surgery and medicine. The ancients did not recognize a distinction between these two, but included both in the "healing art." We, however, mark the essential points of difference, by limiting surgery to the concern of local injuries and disorders, and restricting medicine to those affections which involve the general system. Homer does, in his "Siege of Troy," allude to the two sons of Æsculapius, as being, the one a skillful surgeon, and the other a wise physician, but that this separation was very marked or long-continued, history does not inform us.

General surgery is arbitrarily subdivided, according to the particular part or organ treated, into ophthalmic surgery, obstetric surgery, laryngeal surgery, oral surgery, etc. Dentistry, being almost synonymous with oral surgery, would thus seem to be a part, and a special part of medicine. But not having been so taught by medical colleges, and rather repudiated by them, how has it been evolved as a "specialty" of medicine?

The vast and ever increasing domain of medicine would seem to preclude the possibility of the whole of it being properly cultivated by one mind. Necessity and convenience have, therefore, divided and subdivided it into various branches and departments. Long before the accruing knowledge of modern times embraced this necessity, the ancients had found it expedient to do the same thing. Herodotus tells us that in Egypt, "the mother of the arts and sciences," so wisely was medicine managed, there were physicians, "each of whom applied himself to one disease and only one; some are for the eyes, others for the head, others for the teeth, and others for internal diseases." This system, however, did not prevail generally, and during the slow advance of many years, the individual practitioner was expected to possess all attainable knowledge of the healing art.

But, as each upward step upon the mountain side widens the range and extends the view, successively bringing to sight new and varied beauties of nature, until the farthest reach of vision is unable to take it all in, so the onward march of late study and research in medicine has lead to the discovery of new truths and the development of new principles, until now no one intellect is of such giant proportions as to be able to grasp them all. Necessity, I say, has therefore decreed that it should be parcelled out amongst a number of co-laborers, each pursuing that branch recommending itself to his preference, and so, one and another becoming skillful and proficient in his special branch, would naturally be acknowledged as an "expert," the modern "specialist." This was, perhaps, first observed in the disposition of some physicians to limit their practice to that of surgery proper.

Division of labor, mental and manual, tends to proficiency of attainment. We may ridicule the man with a "hobby" as the one-ideal man, but it takes the man with one idea, persistently and energetically following it, to carry it to a successful issue. A jack-at-all-trades is very often

good at none. He is most apt to excel in art or science, who, in the choice of a life vocation, is wise enough to select that one most congenial to his taste and in accordance with the bent of his genius. Having so chosen, and through ambition and application made a success, it is his mission to pursue it, because therein he can do the most good for his fellow-man.

The modern "specialist" is, therefore, a deservable and legitimate personage. Accordingly, we have in medicine, the specialist of the eye, the ear, the thoracic cavity, the urinary organs, of nervous disorders, of skin diseases, uterine affections, etc. And why not the specialist of the mouth?

This condition of affairs, however, has only been brought about after a long and bitter contest. Only recently in America, the great Marion Sims was bold enough in courage and sufficiently independent in fortune and reputation, to break away from the trammels of arbitrary custom, and successfully advocate the professional recognition of "specialists." In comparatively late years, it was against the "code of ethics" of the profession—'twas quackery—'twas undignified, unbecoming, for a regular practitioner to claim, however modestly, special merit or superior skill in any particular department to which he may have given attentive study.

This prejudice still obtains to a certain extent, and seems to attach especially to dentistry. Why, I am at a loss to understand, unless it be that in its practice it has much of art, and the mechanical arts do not recommend themselves to that pride of intellect which is accustomed to look with contempt upon manual labor as not altogether respectable. General surgery is art, high art—utilizing numerous mechanical instruments and appliances, and requiring dextrous skill, an educated eye and a just perception of the beautiful. These are essential elements of dentistry, and it should not be accorded any less respect and honor on account thereof.

The cases are similar thus far, but the difference which

seems to make the distinction, is, that dentistry has not been acquired in a medical school as surgery has been. Dentistry, as a matter of fact, is not covered by a medical diploma, and to that extent cannot technically be a "specialty" of medicine. What is a diploma, however, but a mere certificate of proficiency? If bestowed upon one lacking the requisite qualifications, it no more makes him an M. D., than does the withholding of it from a worthy man make him any the less a doctor in reality.

Dentistry, from the very nature of things, has grown up outside of medicine. 'Tis like the deserted child who, dis-owned by its mother, and brought up on the bottle, survives in spite of its hard usage. Medicine had already stepped forth in the pride of well developed proportions when dentistry began to take its infantile steps in its practice as a rude art by the uneducated barber. But, as one by one, men of observation would follow out its practical teachings to their logical results, 'twas found that the fundamental principles of medicine underlay them all. These convictions gradually enforced themselves, until the ambitious artist felt impelled to closely study those branches of medicine which he recognized as bearing most intimately upon his own calling. He studied medicine in dentistry because he could not study dentistry in medicine. The wants of her unrecognized child had not been foreseen and provided for by the unnatural mother, and only as circumstances allowed, could they be supplied by itself.

The upward progress was toilsome and tedious. Dark ignorance had to be enlightened, contracted selfishness had to be overcome, blind prejudice had to be dispelled, the sunlight of truth and science had to be admitted. All of this had to be accomplished without the encouragement and against the opposition of the medical fraternity. Pride, prejudice and jealousy took the place of intelligence, penetration and courtesy. Our reverend friend, Dr. Thackston, remembers of his own personal knowledge and experience, how Dr. Chapin A. Harris and his coadjutors made over-

tures to the medical colleges, endeavoring to have dental professorships incorporated in them; how their propositions were scornfully rejected; how they were driven to the necessity of establishing an independent school; and how the Baltimore Dental College, the first dental college ever founded, had to struggle and strive for its early existence. And thus it is. Dentistry came to be taught in separate schools and to be independent of medicine. The dental schools, however, are mere duplicates to the medical schools in anatomy, physiology, pathology, chemistry, materia medica, etc., and the dental student might study these branches as well in one as the other. As time and research extends the spheres of both professions, the necessary provisions will probably be made for M. D's., and dentists being taught and graduated by the same corps of teachers. Harvard University has the honor of having led in this direction, and has been, and will be, followed by other universities. My own judgment leads me to think that dentistry pure, will be better taught in dental colleges.

Year by year, as our standard of qualification is being raised, men of character and education are joining our ranks and are being recognized by physicians as professional equals, being called into consultation with them as occasion may require.

Let us each, therefore, feel resting upon himself individually, the responsibility to uphold the honor and maintain the dignity of our loved profession, and there will be no need of cringing and fawning to secure that honorable recognition of which we are worthy.

* * * * *

It was my good fortune recently to attend a meeting of a State Medical Association, and I was surprised and mortified to learn the very low average grade of education of medical students generally, and the comparative ease with which a medical diploma may be obtained.

Their State laws are very imperfect, affording no reciprocal protection. They have no examining boards, and

nothing like an Association of Faculties. Any bogus diploma will pass muster, and any ignoramus or brass-cheeked pretender may legitimately go forth to practice destruction. In the great State of Georgia there seems to be no legal method to arrest the depredations of impostors and mountebanks. At the very time the Georgia State Dental Society was successfully prosecuting, in the city court of Augusta, violators of the law against the illegal practice of dentistry, a committee of physicians was running around consulting lawyers, hunting offices, and devising measures, in the futile effort to prevent an oily-tongued, jewel-bedecked and brass-mounted quack doctor, from maltreating the citizens, and reaping a rich harvest of ducats, from the hard earnings of his deluded victims. They were really powerless to do more than grit their teeth and look on with smothered curses.

But I merely touch on these educational matters, knowing that we are to enjoy a rich intellectual repast, in some of the papers to be offered on them. Other matters looking to our higher advancement, and suggesting themselves for consideration and action, might be mentioned: the appointment of dentists to the Army and Navy, and on the National Board of Health, our share in Congressional appropriations for scientific research, the approaching International Medical Congress, &c. But I have done.

Gentlemen, has not Dentistry, with her many inventions, valuable discoveries, and signal triumphs, fairly earned for herself a niche amongst the sciences, and has she not before her a future of glorious possibilities?

Only two Sundays ago, I heard for the first time in my life, specific and honorable mention made in a public address, of dentistry as a distinct profession, with no allusion to, or connection with medicine. An eloquent minister of the gospel, in glowing and complimentary terms, referred to it as a new science, which had taken its place among the highest and most important professions of the age.

I thank you for your courteous attention.

Dr. W. H. Morgan, chairman of the Committee on Arrangements, announced that daily sessions would be held from 9:30 to 12:30, and 2:30 to 5:30. Friday being set apart for clinics.

The association then proceeded to the regular order of business.

REPORT OF THE COMMITTEE ON DENTAL ASSOCIATION.

Committee : Drs. B. H. Catching, Atlanta, Ga.; M. C. Marshall, Little Rock, Ark.; G. W. McElhaney, Columbus, Ga.; J. B. Patrick, Charleston, S. C.; W. D. Dunlap, Selma, Ala.; F. J. S. Gorgas, Baltimore, Md.

Dr. B. H. Catching, chairman of the committee, read a paper entitled, "Medical Education for Dentists and Dental Education for Physicians." (Will appear later.)

Other papers on the same subject were deferred to the next session.

The Executive Committee recommended the following applicants for membership :

Drs. J. Crawford, Nashville, Tenn.; G. Chisholm, Columbus, Miss.; G. S. Staples, Sherman, Texas; J. M. Lunquest, Birmingham, Ala.; L. D. Wright, Dixon Station, Tenn.; H. W. Morgan, Nashville, Tenn.; W. D. Taylor, Brownsville, Tenn.; H. H. Barr, Oxford, Ala.; J. H. Prewitt, Madisonville, Ky.; G. Eubank, Birmingham, Ala.; J. S. Franklin, Nashville, Tenn.

On motion, the rules were suspended, and no objections being made, the Secretary was instructed to cast the ballot.

The election being unanimous, the newly elected members were invited to sign the Constitution and pay their dues.

On motion, adjourned to 2:30 P. M.

TUESDAY, July 27.

FIRST DAY—SECOND SESSION.

Called to order at 3 P. M., the President in the chair.

The Executive Committee announced the following applicants for membership :

Drs. D. R. Stubblefield, Nashville, Tenn.; R. B. Adair, Gainesville, Ga.; I. B. McDonald, Shelbyville, Tenn., who were duly elected.

DENTAL EDUCATION.

A second paper bearing this title, by Dr. W. D. Dunlap, of Selma, Ala., was read by Dr. B. H. Teague, of Aiken, S. C. Also a third, by Dr. M. C. Marshall, of Little Rock, Ark.

The subject was then declared open for discussion.

Dr. J. J. R. Patrick, of Belleville, Ill., said: This is a stupendous subject. It is like the harp of a thousand strings: the more you play with it the more music you get out of it. In every society in the United States this question constantly arises. The point most universally, but in my opinion most unnecessarily agitated, is whether or not dentistry is a specialty of medicine. Any attempt to answer this constantly recurring question necessitates a retrospective view, for our profession, like everything else in this wide world, has its history.

If we make medicine the standpoint, it is necessary to know upon what it stands; what the degree of M. D. is supposed to represent. It represents a knowledge of physiology, anatomy, pathology, chemistry, botany, geology—all the sciences; that's what medicine represents. The wisest man of his tribe was the "medicine man."

It is not so very long since the time when any man who devoted himself to any one branch of the healing art was considered a quack by the general practitioner. If he treated only the ear, or the eye, or the teeth, he was a quack; no matter what his education, his skill, his talents, he was a backslider of a specialist. Now there are many schools of medicine—the allopathic, the homœopathic, the eclectic, the electric, and all give the same degree of M. D. It is not a question of schools; they are all willing, all proud, to become the godfather or godmother of dentistry.

What was medicine up to the time of John Hunter? From the time of the Greek and the Roman empires not

one step in advance was made. Medical works, up to the fourteenth century, were all compilations from Greek and Roman authorities. Esculapius claimed to have invented a forcep for the extraction of a tooth, but the ancients knew little or nothing of anatomy or physiology.

Thomas Knox, of Edinburg, was the first anatomist, and that is as late as 1828. The anatomist was anathematized. No believer in a literal resurrection could sanction the cutting up of the body of a human being.

John Hunter was the first one who described the foetal circulation; nothing was known of the diseases of women and children before John Hunter; no one had even described the human jaw, the human teeth. Physiology was nothing at all, until John Hunter made it; it was only a wild theory. And yet he was not a surgeon; he was a clumsy operator. He was a comparative anatomist, but he was not an able man. He was but a wild young man when he went into his brother's office. He taught us that the different preparations of mercury would destroy insect life. [Time up.]

Dr. Wm. H. Morgan: Much that has been said I can indorse most heartily. Dentistry undoubtedly has a history, but some erroneous statements have been made. It was in 1836 (and not in 1840 as stated in one of the papers read) that the first dental association was formed, and it was not the American Dental Association as stated, but the old American Society Dental Surgeons. Up to that time there were no sources for a dental education. When I began to study dentistry, the good old gentleman who undertook my education, told me there were but two authors on the subject: Bell and Harris. The old *American Journal and Library of Dental Science*, was the first fruits of that society. Realizing the inefficiency of office-teaching, that society soon began to discuss the propriety of establishing a school where dentistry could be properly taught. But very few dentists would receive dental students. One offered to qualify them for \$300 in the city, or from \$600 to \$900 in

the country. The first idea conceived was of a dental school, in connection with a medical college, to make it respectable. But the dental students were treated with so much contempt that the idea was abandoned, and an independent dental college organized. Dentistry took care of herself then, and I have a suspicion that she will be able to take care of herself in the future. The college was at first but a small affair, with only but four chairs—one of anatomy and physiology, one of the institutes of dentistry, one of mechanical and operative dentistry, and a fourth which took in a little of therapeutics, a little of materia medica, and a little of everything else.

This college—the Baltimore College of Dental Surgery—has so grown within seventy years that physicians may be found studying anatomy and chemistry in her halls, because they find better facilities there than in the great universities.

And yet it was said in a paper just read that their scope is not broad enough!

Again, it was said that English methods were better than ours! Why? It is well known that the good dentists, few and far between, in Great Britain are all American born, educated here; and so it is in France, in Germany, in Russia. When Gov. Brown was minister plenipotentiary to Russia, the British minister sent to him to ask where he could find an American dentist for his family? American dentistry leads the world, because it is based on a system of thorough college education, which is the outgrowth of society and association work. It is true that our associations are in themselves educators, but if a man had to depend on them alone for his dental education, he would stop short.

As to a medical education, there are branches taught in the medical college which are not taught in the dental college; the place to make a medical man is the medical college; the place to make the dentist is the dental college. [Time up.]

Dr. Catching, of Atlanta, Ga., said: No one disputes the progress made by dentistry in a practical way. It is true that American practical dentistry leads the world. But a man cannot get that medical education from a dental college which will entitle him to recognition as practicing dentistry as a specialty of medicine.

Dr. Morgan was, probably, a remarkably bright youth and he has continued to grow brighter to this hour. But, when Dr. Morgan married and a son was born to him, who, probably inherited the talents of his father, he was not satisfied to qualify that son for the practice of dentistry, in a dental college. He wished to give him all possible advantages, and he was educated at a medical college, and graduated as an M. D., and he stands to-day an M. D., and also D. D. S. That tells the whole story.

Formerly, large numbers of European students sought their dental education in our schools, but now Europe is independent of America. Germany almost denies admission to American dentists; they may practice, but they must not teach.

Dr. Morgan: Is not Dr. Miller, to-day, the most prominent, the leading Professor in the University of Berlin.

Dr. Catching: She does not propose to turn out those who are already holding positions there. In looking at the matter from a college standpoint, it seems to me that Dr. Morgan is speaking for the shekels——

Dr. Morgan: I resent that as a slander. No man can impugn my motives——

(After some excited simultaneous remarks on the part of Drs. Morgan, Catching, Salomon, of New Orleans, and others, order was restored, and Dr. Catching continued:)

Dr. Catching: A college Professor cannot look at this matter in an impartial manner; he looks at it from a college standpoint; from the windows of Vanderbilt college; from the standpoint of the Dean of a Department. I speak simply as a member of the profession, and I must be allowed to speak plainly. A graduate of Vanderbilt told me, not

three months ago, that he considered that when a dentist reached up into the antrum of Highmore, he was getting out of his legitimate field! We cannot stand still; we must either go backward or go forward. The world, and professional pride, demands that we go—not backward, towards the barber-shop again, but forwards, into the science of medicine. The practical field is large, but if we wish to attain the highest standard, it must be through a medical education. To graduate only as D. D. S., has ceased to be a benefit; it acts as an injury to our advancement. We should enter a reputable medical college, and come out as M. D., and then enter a dental infirmary, where the practical work of dentistry is taught by the very best men. When we come out from the medical college and the dental infirmary, we shall be entitled to recognition as practitioners of the dental specialty of medicine.

Dr. Salomon, New Orleans, said that Dr. Catching had portrayed the ideal future of dentistry, but not what was possible in the present; that coming from Germany, yet what he knew of dentistry, he owed to the Baltimore College; but that things had changed for the worse since 1870. New American colleges had been established, which take men in who can scarcely write or read; who are only fit to stand behind the plough or the work-bench. Germany now stands the highest, for the dental school in the University of Berlin registers a very high standard of education. How many dentists understand the effects of uterine affections, or of menstruation upon the teeth? Either dental schools must afford broader medical education, or medical schools must enlarge their dental facilities. American graduates are not allowed to use the title, "doctor," in Berlin, but must graduate again. One thing that has degraded American dentistry in Europe is the fact that ignorant German office-boys, who have saved two or three hundred dollars from their wages, and picked up a few stray technical phrases; who have "studied" for many years while sweeping out offices and washing spittoons, come and spend eight

or ten months in America, and go back as Doctor So-and-So. It would be a shame and an outrage to cast reflections on our Alma Mater, but it is our duty to urge our colleges to enlarge their sphere of usefulness ; not casting reflections on the old colleges, nor seeking to abolish them, but looking to higher standards for the future.

Dr. Morgan: Allow me one word in reply.

President Wardlaw: When all who desire to do so, have spoken once.

Dr. B. H. Teague, Aiken, S. C.: We all know that a great deal of good comes out of these discussions. Much benefit may be gathered from the remarks of those who have spoken. Dr. Morgan was timid, so to speak, in expressing himself, knowing that he occupied a position easily assailed, being on the dental faculty ; but we know him to be a pure, upright man, and a good educator. Dr. Catching is equally pure and upright, and equally interested in the question of dental education ; but each one looks at it from a different light ; it is only necessary that they should understand each other. What Dr. Salomon has said is true in every respect, for it cannot be denied, that of late years American dentistry abroad has brought disrespect upon the profession. Germany is of a jealous nature ; she will not, knowingly, admit an enemy within her borders. Her public has been imposed upon by our graduates, and our American colleges require overhauling. We graduate men who are not educated men. The trouble lies at the threshold. A young man who holds a pseudo certificate that he is "a good student," is not asked whether he can write a good hand ; whether he has graduated from a literary college, or from a good high school ! Often he is allowed to use the name of some unknown member of the profession as preceptor ; uses the infirmary a few months in summer, and not having much money to spend, graduates at the end of the second term ; but that diploma does not make him a dentist. But I believe in dental colleges. I am glad I am a dental graduate, and am only sorry that I am not a med-

ical graduate as well. A man cannot get a diploma from a literary college if he is not an educated man. President Garfield had to work a long time to pay his way through. If the qualifications for admission to the dental colleges were of the proper standard, we should have fewer unwon diplomas. Medical colleges experience the same difficulties. We should require the student to be an educated man, and we should see that his preceptor also is an educated man.

Dr. H. J. McKellops, St. Louis: This is a very broad question. I do not stand before you as a graduate, myself: I am a self-made man. I earned the money for what little education I had, and there are plenty of such men. We all see the want of education. When I look around upon these young men, and see the opportunities they enjoy, I cannot but exclaim: "Oh God! if I only 'had the chance they throw away so lightly!" I paid dollar for dollar for all I ever got. If it was a receipt for soft solder, I had to pay for it, and I had to make the money myself. I love my profession, and I love every man it. I put the latch-key out, and say to every man: "You are welcome to my office, and to learn all you can in it." My patients never refuse to let my professional brethren stand by my chair. I never say to them, as has been said to me: "Excuse me, but Mrs. So-and-So is in the chair, and she does so hate to be seen!" I train my patients differently. Last May there were 2,200 doctors in St. Louis, and they did not turn their back on dentistry. Many of them are members of both professions; they are the favorites of one and the pride of the other. But dentistry is bound to be a separate profession; it is not part and parcel of medicine. John Hunter was no graduate; he was a poor, miserable boy before he got into the office of his brother. I wish every young man would study the life of John Hunter. He would see that it all lies with himself. Only his own personal exertions can place him on the top round of the ladder. If you would make your mark, it lies only with yourself. A few years ago, I saw six or seven German women, who

could not speak a word of English, studying dentistry in a college at Philadelphia. Graduates from the Michigan college, or from Harvard, can go to London and practice without an examination. In Paris and Germany, they are waking up. I went to New York to see Mr. Herbst operate. I stood by him ten days. He has no patents to sell. He freely gives all he has. He says: "I have brought my baby to this country—I want to show it to you. If you don't like it, I'll drown it." That man has genius. As to Professors in our colleges—there is no money in it. It is time lost and money out of pocket.

In response to urgent calls, and at the request of the President,

Dr. W. W. H. Thackston, of Farmville, Va., took the floor. He said that in the earlier efforts toward dental education, alliance was sought with medical colleges and medical departments of universities, but we had been driven to rely upon our own resources; and without egotism or boasting, he could now feel just pride in the condition of dental surgery, of dental science. For centuries medicine had entire control of the field. Harris, Hayden, and the Parmlee's were the fathers of American dentistry. They had instituted an independent system of education, and had a right to be proud of its results—in the men it has made—and now this system is sought to be abrogated—why? Because some men under it are not what they ought to be! American dentistry leads the world, and the American system of education is the best in the world; but no system whatever can force ideas through thick skulls, or fill empty heads with brains. Other professions have their *quacks*, as well as ours; we do not have all the noodle-heads. There are some in medicine, and some in law, and some in the ministry. This independent system ought not to be hastily abandoned, though it may be improved. It would be making too great concessions of dignity and self-respect to go back now to the medical schools which so long gave us the cold shoulder. We can raise up a class of men to do

us honor without going to the medical schools. One point that has been overlooked is, that there are few men who are fit to be dental cadets. Men who might make a distinguished reputation as physicians, or as lawyers, are not always fit for dentists. Medical students never have done, and there is no reason to believe they ever would do, better than dental students.

When the millenium comes it will make very little difference whether we attend medical or dental schools, but until that time let us be careful not to make any serious departures from established practices.

Dr. G. F. S. Wright, Columbia, S. C.: The subject is one of great interest, and on this, as on many others, we require frequently to be reminded of what we know. State Dental Associations have been the leading influence to foster training in dental schools, and during the past twenty years laws have been enacted in many of the States to regulate the practice of dentistry. It is a principle in common law that the law cannot make a crime of what was not a crime before the law was made. Men cannot go into a State where there is an efficient dental law, and practice dentistry unless qualified, but men already in practice cannot be interfered with. They have to be accepted with all their defects; we cannot make them go to college and acquire what they lack. The gentlemen who are so enthusiastic lose sight of what is being done in this direction. It will not be long before every State in the Union will have a law as efficient as that of Georgia, where a man cannot practice unless he is really qualified.

Dr. Jas. Johnson, Staunton, Va.: I love my profession. Surgery was my first love, but I left it for dentistry. I am glad to learn there is one State where the law has proved effective. In Virginia we have just passed such a law; before we could not get what we wanted, but now we have the law, and hope we can make it effectual. It is true, there are a great many now in practice whom we cannot reach; we cannot educate them. We shall have to be patient till

they die off, for we cannot touch them. As things now stand, we need some change. I have looked the matter over carefully and think what we need is the establishment of universities with endowments. With well endowed chairs, we could get the best that the profession has. But as things are now we cannot obtain the best talent for our colleges; we have not the means to pay for it. The University of Michigan, with its endowment of \$10,000,000, has grand opportunities. This is also true of Baltimore and Harvard.

Dr. Morgan: Baltimore is not endowed.

Dr. Crawford, Nashville: Dentistry draws from all other callings. It is the rarest thing in the world for a dentist to leave his profession and go into other business; but men from all occupations come to us. There is a fascination about it even in its present crude state. In a large per cent. of the literature of dentistry, fundamental principles are viewed from a medical stand-point. In our periodical literature the best articles come from men who sign M. D., with perhaps the addition of D. D. S., but the M. D. takes precedence.

The idea that "the dentist must be a doctor," has come to stay. The man who has the training and education necessary to receive that M. D., comes to the front. One idea which has been much talked about, ought to be repudiated—viz: that because Dr. So-and-So graduated at such an institution and is not competent, therefore that institution is to be condemned. We should not discourage our own institutions. They have turned out many good men, even if there have been some failures. We should extend a helping hand; help to correct their errors, but not abuse them.

I repeat, however, that the idea that a dentist must be a doctor has come to stay. [Applause.]

Dr. Morrison, of Nashville, said that he got his degree from Baltimore; that he had earned the money for his education between the plough-handles. He did not want the

degree of M. D. A Latin scholar, five years away from his books, could rarely translate ten lines. Had seen diseased antrum of Highmore successfully treated by a man who never went to college; without instruction or text-books, by intuition almost, he was successful. He had also heard another, who boasted of his attainments, talk of "cutting out an ingrowing toe nail clear to the cementum!"

Dr. Stubblefield said that he occupied the same vulnerable position, as he was connected with a dental college and might be critized. Dental education was no longer a mooted question. It was uncalled for to talk of *shekels*. A man who expected satisfaction would go to an expert in any line. If it was a question of metals, he would go to a metallurgist; if a question of law, he would go to a lawyer; if on dental education, he would go to an educated dentist. If we could get every dental student to first graduate from a literary college, or even a high school, we would have a broad foundation on which to put the cap-stone. But we have few graduate-students, and must do the best we can with the material that comes to us.

We all honor Dr. McKellops. If, with the fine material which nature gave him, he had also had the educational facilities of to-day, what might he not have been? Native ability, thoroughly educated, can accomplish everything. Those who cannot hold out in the battle of life, have not the nerve to stand and fight it out.

I left the medical profession to be a dentist, and have never regretted it. God gave me mechanical instincts which find their proper outlet in dentistry. Special dental schools have their merits and demerits, but whether educated in a dental college, or in a dental department attached to some other school, makes but little difference if the man be of the proper temperament. "A man's a man for a'that."

Education means "leading out"—the better educated a man is the more capable he is of exercising his mental faculties; he is better developed, with power for better work.

Dr. Morgan rose to a question of privilege. He said I have made it the rule of my life to eschew personalities, and to conduct myself properly before my brothers. But I cannot permit any one to impugn my motives, or to insinuate that I am capable of dishonest work for the sake of money. I desire to tender my apologies for the hasty language I used, but I will say that I have spent \$100 for the advancement of the profession where I have received five. My own education was very limited. If the rules then had been as stringent as they are now, I should have been shut out. I knew how to read, write and cipher, but I have worked on the streets of this city for forty cents a day since I became a man grown.

There has been a constant intimation here to-day that when men have attained a certain degree of education they are *entitled* to a degree; that the man who has studied and understands medicine is a doctor. This is all a mistake. Doctor is a degree conferred, on certain conditions, and a man cannot be a doctor unless the degree is so conferred, and it is practically a fraud to call a man doctor upon whom such a degree has not been conferred. A man may be a physician or a dentist, but he is not a doctor. The degree is conferred on certain conditions, and unless those conditions are complied with, not all the fame or the knowledge of an archangel *entitles* him to it.

Dr. McKellops: If a man presents himself for examination and passes honorably, is he not entitled to a diploma?

Dr. Morgan: No, sir; the institution requires that certain conditions shall be complied with, certain fees shall be paid, a certain curriculum passed, and a man is not entitled to a diploma until he has complied with all these conditions. The intimation has been made that I am not in favor of a broad education. Why: I have fought for that very thing for years. Every professor in the institution with which I am connected has M. D., and I had something to do with their selection. I chose them because I thought they had the requisite qualifications.

Some men have queer ideas of science. Something was said about young men who were taken into an office until they could polish plates, and on a certificate to that effect, enter college. I tell you if a young man can make a first-class polish on a gold plate he knows the science of it. He has done it, and he knows how it is done.

The proportion of thoroughly educated men in medicine and in dentistry is largely in favor of dentistry. I may say ten to one, in proportion to the number engaged in the two professions. It is not what a man knows when he goes into the college, that makes him what he is, but what he knows when he comes out.

As a rule, any office-teaching we get to-day from the average dentist, is a disadvantage. I would rather take a young man from behind the plough. It is a mistake to think that office training fits a young man for the dental college; it is wrong to the very core. Neither do I see the necessity of teaching all the branches of medical science, to make a man a practical dentist. What use has he for midwifery or pharmacy? of how to treat yellow fever or cholera? When he comes to practice dentistry he will have no use for it. If there is a case of cholera in the neighborhood, he will want to get away from it. Let him prepare himself for dentistry, on a broad foundation, but lay aside all collateral branches. The respectability ~~of~~ the disgrace of dentistry rests on your shoulders.—*Southern Dental Journal*

ARTICLE II.

PYORRHŒA ALVEOLARIS.

BY ALFRED R. STARR, M. D., D. D. S.

Pyorrhœa Alveolaris, sometimes called Rigg's disease, catarrhal or suppurative gingivitis or ulitis, and, alveolar pyorrhœa, is a disease of which much has been written, but

as yet little is known. It is described by some as a disease characterized by a flow of pus from the tooth sockets. The effect upon the gums and alveoli differs very materially from the usual results of salivary calculus, in that in this disease the ulcerative process or retrograde metamorphosis is most marked in the pericementum and alveolus, while the gums are comparatively free. In this affection the destruction and separation of the pericementum and the absorption of the alveoli are greater and more rapid than the recession of the gums, thus resulting in the formation of deep pockets between the gums and the teeth, from which pockets exudes an ichorous or sanious discharge. In cases of salivary calculus proper, with no secondary sanguinary deposit, the recession of the gums, destruction of the pericementum and absorption of the alveolus occur slowly, and the process is limited to the immediate vicinity of the deposit; so that if we go a little beyond the point of contact of the deposit with the gum, we will find the pericementum and alveolus in quite a normal condition.

This is the case, even when the deposit has encroached upon the alveoli almost to the apices of the roots. Even in these cases we may have a foetid, sanious discharge, but instead of proceeding from deep pockets it comes from the tissues in the immediate vicinity of and directly underlying the deposit. If any pockets are formed in these cases of salivary calculus they are very shallow, and the destruction of the pericementum and absorption of the alveoli show little tendency to increase any more rapidly than the ulceration and recession of the gums. In pyorrhœa alveolaris there is frequently no recession of the gums, little or no salivary calculus about the necks of the teeth, and yet we have extensive involvement of the pericementum and alveolus and usually, if not always, the presence of the dark or sanguinary variety of tartar on the roots.

We sometimes see the manifestations of these two affections, viz: salivary calculus and pyorrhœa alveolaris, on one and the same tooth. In the case of salivary calculus

proper, the deposit precedes and causes destruction of the pericementum, while in this disease some peculiar irritation of the pericementum precedes and causes calcareous deposit.

The etiology of pyorrhœa alveolaris is very obscure. Authorities are very evenly divided as to whether the causes are constitutional or local. Some regard it as a localization of a systemic debility, while others believe it to be due entirely to local causes, and amenable to local surgical treatment. Some attribute the occurrence of the disease entirely to the presence of tartar and its effects upon the surroundings of the teeth, while others say that while tartar is usually present it is only a concomitant or sequence of the affection and never the cause. Those who maintain the latter view declare that the disease sometimes occurs without the presence of any tartar.

Constitutional dyscrasia (hereditary or acquired), extreme density and low degree of vitality of the teeth, suppression of habitual secretions, catarrhal inflammation, the presence of bacteria, of foreign deposits (salivary, serumal or sanguineous), and local irritation from the use of wedges, ligatures, rubber dam, &c., have been assigned as causes.

The influence of heredity in pyorrhœa is often quite marked, the disease being transmitted through several generations. Cases have been noticed in which children born before the acquisition of the disease by the parent or parents have been exempt, while those born subsequently have developed it at quite an early age. Among the cases due to acquired constitutional predisposition may be cited those caused by mercurialization, or some peculiarity of diet, nutrition, or nervous influence.

Pyorrhœa alveolaris very frequently follows mercurial salivation. The statement has been made that pyorrhœa alveolaris never occurs except in persons who have been salivated, but this theory has not been generally accepted, and I do not believe it is founded on fact.

It is believed by many that excessive use of chloride of sodium will sometimes cause pyorrhœa alveolaris. Some

authors assert that imperfect elimination of urea is its principal constitutional antecedent.

In support of the theory that suppression of habitual secretions may aggravate or incite this affection, Dr. Rehwinkel cites the case of a young lady aged eighteen, otherwise healthy, and with no accumulation of salivary calculus, in whom the teeth became very loose, presumably from the fact that the menses had never been established. The extraction of two or three of her teeth, although they were very loose, produced violent and persistent hæmorrhage. Local treatment and hygienic measures checked the progress of the malady, and when, after some months, menstruation was established, the disease disappeared and the remaining teeth became firm. Dr. Patterson has said that he believes the disease to be of a catarrhal nature, and he also inclines to the belief that the calcular deposits are simply the result or sequence of the disease. Dr. Patterson states that in the cases he has observed he has found co-existing nasal, pharyngeal, or laryngeal catarrh (generally combined) in every instance. He believes the disease is generally caused by infection from a pre-existing catarrh of the nose or throat, but states, also, that the catarrhal condition of the mouth may originate in that cavity, and not be due to infection, or (I think he should have said) extension of the disease, at all. These primary cases, he thinks, are most apt to occur in those who are in the habit of breathing through the mouth. In support of his theory Dr. Patterson cites the following points of similarity in the pathology of the two diseases, viz:—Nasal catarrh and pyorrhœa alveolaris.

1st. The similar appearance of the affected mucous membrane in both diseases and in the various stages of each.

2nd. The identical character of the effusions, viz: first serous, containing numerous epithelial scales, and then becoming filled with pus and blood corpuscles.

3rd. The infectious nature of both diseases, nasal

catarrh being contagious and sometimes epidemic, pyorrhœa alveolaris frequently showing a tendency to spread from one tooth to the next, until all may be affected.

4th. The similar burrowing of pus in each trouble.

5th. The tendency in each to destruction of periosteum and underlying bone.

6th. The calcareous deposits occurring in each disease. (Deposits of phosphate and carbonate of lime are sometimes formed in cases of nasal catarrh.)

It is possible that the predisposing or constitutional cause of pyorrhœa alveolaris may, in some instances, be a tendency to catarrhal inflammations; but I do not believe, as does Dr. Patterson, that this disease is transmitted from a pre-existing catarrh of the nose or throat. It is true we can have, according to the medical authorities, an extension of catarrhal inflammation from the nose, throat, or even from the stomach, to the mouth, and we then have acute or chronic oral catarrh, or catarrhal stomatitis; but in such cases the process is a general one, and affects not only the mucous membrane of the gums, but also that of the lips, cheeks, tongue, &c., which condition we do not have in pyorrhœa alveolaris. Dr. Patterson states that both nasal catarrh and pyorrhœa alveolaris are of an infectious nature, and further states that text-books all agree that nasal catarrh is not only contagious, but sometimes epidemic.

There may be some instances in which the disease appears to be infectious. The epidemic said to have occurred in St. Gall, Switzerland, in 1876, if the reports be authentic, would be an instance of this kind. In this epidemic the disease was said to be very severe, and investigation demonstrated the presence of numerous parasites (leptothrix, bacteria, &c.) in the secreted matter, but no pus corpuscles. Schlenker, who studied these cases, concluded that the presence of the parasites was the cause of the inflammation of the root membrane. Some observers, among them being Dr. G. V. Black, of Illinois, and Dr. Witzel, of Germany, believe that the disease is caused by a certain species of

fungus. We cannot deny the possibility of such a mode of origin, although I think no one has yet been able to demonstrate, by actual experiment, that there is any specific virus or contagium in this disease. I have endeavored to transmit the disease by inoculation from the human subject to the dog, but so far have been unable to produce anything except a negative result. My method has been to make a slight incision between the gum and the prominent cuspid tooth of the dog, and inoculate with the fresh discharge carried on an instrument directly from the patient to the animal in the next room. It may be that the lower animals are not capable of developing the disease. It might be interesting and instructive to experiment in the mouth of a patient affected with the disease, by inoculating from the socket of an affected tooth to one not affected (by applying the discharge to a denuded surface), and observing the result. I have not as yet experimented in this manner to any great extent. Dr. Patterson states that there is the same tendency to destruction of periosteum and underlying bone in this disease as in nasal catarrh. I beg to differ with him in regard to the tendency to destruction of bone in pyorrhœa alveolaris. In nasal catarrh, when the bone is involved the process is one of caries, or necrosis, while in pyorrhœa alveolaris I think it is only very rarely that we have such a condition; but of this we shall speak further in treating of the pathology of the disease.

Whether or not there is always a constitutional predisposition in cases of this disease, is still a matter of much controversy. The preponderance of opinion seems to be that there is usually a constitutional predisposition. The traumatic or acute cases, without doubt, are due entirely to local causes, since almost any irritant of the kind described will induce the disease, and the removal of the cause results in a speedy cure. Cases in which salivary calculus irritates the pericementum and causes secondary sanguinary deposit might be classed as traumatic, for the exciting cause is a foreign body; but, although to a certain extent traumatic,

they cannot be called acute cases, since the disease when induced by this cause generally assumes the chronic form. Perhaps this may be accounted for by the fact that the salivary deposit increases very gradually, and the irritation is less on that account. I think that even in these cases of pyorrhœa from the irritation of salivary calculus, we must admit the presence of a constitutional predisposition (I refer now to typical cases, in which we have the deposit of sanguinary calculus and the formation of ulcerating and suppurating pockets); because we know that not all cases of salivary calculus, or of pericemental irritation, are followed by this disease. In fact, it results in comparatively few instances.

It is difficult to draw the line between local and constitutional origin in these cases, for if the exciting cause be salivary calculus, that in itself is often dependent upon constitutional derangement for its development. The cases in which we find no appreciable exciting cause are the ones less amenable to treatment.

To sum up, then, we regard the traumatic or acute cases as essentially local in their origin, since they are so easily induced and are so readily amenable to local treatment without showing any tendency to recurrence; but in the idiopathic or chronic cases, or those of pyorrhœa alveolaris proper, we think the causes are both predisposing and exciting, and that there is generally, at least, a constitutional predisposition rendering the disease liable to occur under local irritation, either mechanical or chemical. Salivary calculus, I think, is the most common exciting cause. The irritation of partial plates would probably come next in order of frequency. What the predisposing cause or causes may be, we are as yet not aware. Possibly the same, or a similar influence to that which causes exostosis of the cementum, may operate in determining the origin of this affection, the difference being, that in this disease the lime salts, instead of helping to form an organized tissue, are deposited in an amorphous manner. I think I have met

with a greater number of cases affecting the teeth of the superior maxilla than of the inferior; but whether or not this has been the experience of other observers, I am not aware. The disease is one of adult life, and is common to both sexes. It is very rare in young persons, except when hereditary.—*Independent Practitioner.*

ARTICLE III.

DENTAL JURISPRUDENCE.

BY RICHARD GRADY, D. D. S.

Since the publication of my article on "Dental Jurisprudence," January, 1884, the following additional cases have come into my possession, which I now print as a supplement to the twelve cases therein noted. Several of these prove the importance of dentists keeping specific records of their dental work. My plea then that "Dental Jurisprudence should have not only a name but a local habitation" has been recognized, and there will be issued before June 1887, "The American System of Dentistry" in three octavo volumes, volume III embracing *Dental Jurisprudence*.

RICHARD GRADY,

(Doctor of Dental Surgery.)

BALTIMORE, September, 1886.

13. *Identification of the Prince Imperial.*—The circumstance of the Prince Imperial's death has revived a question which has been somewhat neglected by lawyers and physicians, viz: the importance of the teeth as a means of identification of deceased persons. The late Prince Imperial had been so much disfigured that identification would have been extremely difficult but that the Prince had had four small cavities in the first molar teeth filled with gold by

Dr. Rottenstein, of Paris, and had met with a slight accident in April, 1876, from a blow on the front teeth, which had made it necessary to fill the teeth a little in order to smooth the enamel. These constituted signs which are unalterable even by ages; and, as careful dentists keep usually a record of such operations, they afford a means of identification which is unerring, and which, as in the present instance, was of great value, and might, under certain circumstances, be of the highest importance.

14. Miss Nellie D. Cooley, of Wilkesbarre, Pa., who disappeared in so mysterious a manner from her home on December 9, 1883, was found May 27, 1884, after a lapse of five months, in the Susquehanna River. The remains were so badly decomposed that all identification by general appearance was impossible, until Dr. C. S. Beck, dentist, of the above named place, was called as a witness by the coroner's jury, and he positively identified the remains by the structure of the teeth and the fillings he had inserted in some of them. So much for dental science.

15. "If you saw the man who bit that orange, would you be able to recognize him?" said an officer to me once. A robbery had been committed in a house, and the robber had bitten into a hard sour apple he found on the center-table, and had then thrown it on the floor.

"Yes, I think I could," we replied; "and I believe I can so describe him to you that you can identify him. He has large upper central incisors, the front edge of the left one is turned out a little. The left lateral is gone and the right lateral is twisted nearly half way round. That man I believe was in my office a month since and had a little work done. Let me refer to my chart book.—His name is Mr. ———, and I filled three ———."

"But Doctor," interrupted the officer, "the young man you name is entirely above suspicion. It can't be he."

But it proved to be he, and he was sent to State's prison for the offense.

16. *The Teeth from a Medico-Legal Aspect.*—The identification of dead bodies and criminals is sometimes a matter of much perplexity. For instance: the features of a dead body may be distorted or destroyed; the clothes changed or unrecognizable; and no ordinary circumstances left to make identification clear. Some such a case occurred in Michigan, A man was found in a lake murdered. As the coroner was about dismissing the case as "unidentified," the neighboring dentist had the curiosity to look into the mouth. In a moment he said, "I have a chart of that mouth in my office," and though he could not then remember the name, he soon found it by referring to his chart book. It resulted in tracing the murderer.

17. *Twenty Years After. An Iowa Doctor discovers the remains of his Brother.*—A very remarkable case of the finding and identification of the remains of a Union soldier twenty years after he fell has just come to light. During the war a brother of Dr. Conoway, of Des Moines, Iowa, enlisted in a Pennsylvania regiment and went to the front. He was engaged in most of the battles of Virginia, and finally fell before Lynchburg. He was buried without being recognized, and appeared on the muster-roll after the battle as "missing." Young Conoway, so far as the family could learn, was seen to fall in the front of a charge against the breastworks, and then all track of him was lost. The war passed by, and, despite the most careful inquiries, no trace of the boy could be found. Last month Dr. Conoway attended a national medical convention in Pennsylvania, and when its sessions had closed, extended his journey into Virginia in search for the remains of his soldier brother. After visiting many battle-fields, he finally came to Lynchburg and there discovered a man who had been a member of the same regiment as the deceased, and who had seen him fall. This young man had been a member of the burial party. Young Conoway had not been buried in the trenches, but in a separate ground on a hillock

near by, which, the man said, he thought he could recognize. Adding him to the searching party, the battle ground was carefully scoured and the lone grave discovered. Of course, the flesh had disappeared, but from a peculiarity of the teeth Dr. Conoway was fully able to identify the remains. Among the remnants of clothing was found a small phial tightly corked, inclosing a slip of paper, on which was written his brother's name.

18. *The St. Louis Trunk Tragedy.*—The relatives of C. Arthur Preller, who was killed by Maxwell and his body packed in a trunk at the Southern Hotel, recently discovered a receipted bill among his effects by which they ascertained that Dr. Burnette, of San Francisco, had filled his teeth in March, 1878. They wrote to Dr. Burnette, who referred to his books, and then replied that he had filled some teeth for Preller. The counsel for Mr. Preller's family in the suit they have brought to recover the insurance on his life, has written to Dr. Burnette to learn what work was done on Preller's teeth. When he receives the information he intends to have the body exhumed and the teeth examined. It is believed the testimony thus secured will be very important, not only in the insurance case, but also in the trial of Maxwell for murdering Preller.

19. *A Massachusetts Mystery. Detectives seeking for the Murderer of the Body found at Wrentham, Mass.*—The excitement over the finding of the skeleton of a woman in a field in Wrentham is still spreading in that neighborhood. The medical examiners have carefully looked over the skull and find that the ball passed completely through it, indicating that the shot was fired by some one who sat or stood at her right, and that by no means could she herself have used the weapon.

Last evening it was seen that the upper teeth were false, and that there was a small gold-filling used to give

the set a genuine appearance. They were of superior workmanship, and were undoubtedly made by a city dentist.

20. *Miss May Hatch. The Identity of the Body.*—Miss May Hatch, of Baltimore, went to Norfolk Va., June 16, 1886. From there she took the steamer for Boston, and when on the ocean, it is claimed, committed suicide by drowning. To perfectly establish the identity of the remains of Miss Hatch, Dr. Norris, of North Charles street, the family dentist, examined the mouth and teeth of the body the morning before burial. The young lady had been at various times under his professional treatment. Comparison with diagrams in the doctor's possession left no room for doubt regarding the identity of the corpse.

Editorial, Etc.

THE UNIVERSITY OF MARYLAND will begin the session of 1886-87, in its Dental Department with a larger class than has ever before in its history been present on the first day of the regular sessions. This institution, from the ability displayed by its graduates in different parts of the world has acquired a reputation of which there is reason to be justly proud, and the increased number of each class at the annual sessions is an evidence of the appreciation of the efforts made by its Faculty to maintain a dental school of the highest character and to thoroughly educate students for the successful practice of dentistry in all its branches.

Although extensive additions have been recently made for the accommodation of the steadily increasing number of

students, all of whom are afforded equal facilities, the question already presents itself for more space.

That the success of this Department of Dentistry is beyond any example heretofore known is beyond question, and the prospects for the future are of the most promising character. Students from many foreign countries, some represented by a large number, and the majority of the States of this country have already matriculated for the session of 1886-87, the exercises of which begin on the first day of October, 1886.

DR. WILLIAM HERBST.—The reception extended Dr. William Herbst during his recent visit to this country has been of the most cordial character, and he will no doubt have been impressed with the fact that true merit is always recognized by those of our profession whose recognition and appreciation are worth having. The following is an account of a clinic held at the office of Dr. Bodecker, of New York, and which is described in the *Independent Practitioner* :

" Dr. J. C. Proud took the operating chair, and Dr. Herbst filled for him the right upper second bicuspid, the cavity occupying the distal and grinding surface of the tooth. Previous to the excavation a matrix of German silver was prepared in the following manner: A piece of German silver, No. 32 American gauge, one-quarter of an inch in width and one and one-half inches in length, was passed around the bicuspid to be filled. Then, by means of a blunt pair of cutting forceps, which in form somewhat resemble a pair of flat-nosed pliers, it was drawn around the tooth in such a way as to make it fit very closely. The German silver ring was then withdrawn from the tooth, a little soldering fluid (solution of chloride of zinc) was applied to the flanges and the ring soldered. One of the principal points to be remembered in the making of this matrix is to avoid allowing the tin solder to run to the side of the matrix next the cavity to be filled, as when the tin is touched by the rotating instrument some of it will be incorporated into the gold and the cohesion of the separate layers of gold impaired. Previous to soldering the matrix must be made perfectly clean, and this is done by means of a piece of

cotton wound around an engine bur dipped into moistened pumice stone, and this rubbed over the ring, inside as well as outside. After the cavity had been thoroughly excavated, the rubber dam and the matrix were applied and the filling introduced upon the cervical wall of the cavity. Dr. Herbst placed a very thin layer of tin, burnishing it up over the pulp, which was very nearly exposed, thereby modifying thermal changes. The tin was then followed by a layer of Wolrab's gold cylinders, No. o, condensed in the usual way, first with the hand instrument and then with an agate point in the dental engine. When this was completed, a fine instrument made of a broken excavator was pressed all over the surface, first to discover all imperfectly condensed plates, and secondly to roughen the polished surfaces of the gold, thereby obtaining better unity of the layers of the filling. The introduction of the gold occupied about eighteen minutes. The gentlemen present at the meeting were Drs. Taft, Bonwill, Abbott, McKellops, Rehwinkel, Tennison, Andrews, V. Pressler and Rhein.

In the afternoon another clinic was given, at which Dr. Herbst filled a lower molar handed him by Dr. Dwinelle, which had been extracted over thirteen years. the cavity occupying the mesial and grinding surface of the tooth. Previous to excavating the cavity, a German silver matrix was applied, as mentioned before, but in addition to the matrix a brass wire was soldered all around it with soft solder, in order to stiffen it. After the cavity had been excavated, the tooth was imbedded, with the matrix in position, in a large piece of shellac. The first layers of gold were condensed by means of a piece of cotton in the following manner: Cotton enough to fill the cavity was put over the gold, and then, by means of a large smooth engine burnisher, it was burnished into every corner where there was any gold; when the cotton was removed, it showed that the gold was thoroughly depressed into every portion of the cavity, and it was then further condensed by means of agate instruments in the dental engine. Dr. Herbst here remarked that the cotton, when applied in this manner, will make the most cohesive gold non-cohesive, but the moment rotating instruments have been used upon the surface it

will again become as cohesive as before. The rest of the layers of gold were applied in the usual way, until the cavity was nearly full, when one of the walls of the tooth gave way on account of the desiccated condition of the dry tooth, and the defect had to be repaired with gold, without removing the matrix, although the edges of the tooth could not be made perfectly smooth. When it was filled, the shellac and the matrix were removed, and the gold was found to be absolutely perfect in every respect. The filling was then finished with sandpaper disks, without burnishing the outer surface, so as to see whether the gold had reached all the rough edges of the broken wall. It was very critically examined by Drs. Taft, Dwinelle, Rehwinkel, Parr, Northrop, and Bogue, all of whom agreed that the operation was absolutely perfect.

Dr. Herbat then filled a cavity in a steel matrix (the same one used by Dr. E. Parmley Brown for ascertaining the comparative weight of gold when condensed by the different methods of filling teeth), into which he introduced Wolrab's gold cylinders, No. 0 by means of hand instruments, assisted by his new agate points. This matrix was filled in about nineteen minutes, and the filling, when completed, weighed eighteen and one-sixteenth grains, or, one-sixteenth of a grain more than the filling introduced by Dr. Brown, with the electric mallet and an extra powerful battery, in forty minutes time.

Dr. Dwinelle to satisfy himself as to the possibility of condensing gold by means of a piece of cotton, took an engraved stone, and after he had introduced a few large Wolrab cylinders, applied a piece of cotton over it and condensed the gold with it. When removed from the matrix, the gold was found to be a beautiful and exact counterpart of the engraved stone."

Bibliographical.

THE AMERICAN SYSTEM OF DENTISTRY.—In treatises by various authors. Edited by Wilbur F. Litch, M. D., D. D. S., Professor of Prosthetic Dentistry, Therapeutics and Materia Medica in the Pennsylvania College of Dental Surgery. Published by Lea Brothers & Co., Philadelphia, 1886. This work will be published in three volumes, royal octavo. Price, per volume, cloth, \$6; leather, \$7; half morocco, gilt top, \$8.

Volume 1st has been issued and includes Regional and Comparative Anatomy, Dental Histology and Dental Pathology. G. V. Black, M. D., D. D. S., Professor of Pathology, Chicago College of Dental Surgery, contributes treatises on "General Pathology," "Dental Caries," "Pathology of the Dental Pulp," "Disease of the Peridental Membrane," and "Abrasion and Erosion of the Teeth." M. H. Cryer, M. D., D. D. S., Chief of Clinic of Oral Surgery, Medico-Chirurgical College, Philadelphia, contributes "Regional Anatomy." James Truman, D. D. S., Professor of Dental Pathology, Therapeutics and Materia Medica, Dental Department University of Pennsylvania, contributes "Diseases of the Dental Pulp and their Treatment." Albert P. Brubaker, A. M., M. D., D. D. S., Professor of Physiology and Pathology, Pennsylvania College Dental Surgery, contributes "Lymphatic Vessels of the Head and Neck." "Embryology and Dental Histology," is contributed by W. Xavier Sudduth, M. D., D. D. S., Demonstrator of Dental Histology, Philadelphia Dental College. Jacob L. Wortman, M. D., Anatomist to the U. S. Army Museum, contributes "The Teeth of the Vertebrates," and W. H. Dall, Curator of the Department of Mollusks, National Museum, Washington, contributes a treatise on "The Teeth of the Invertebrates."

The authors of the above articles are gentlemen well known to the dental profession and recognized as practitioners of distinguished ability. The editor, Dr. W. F. Litch, can congratulate himself on the success of his undertaking as the authors of the articles contained in volume I have certainly treated their subjects in a very able and comprehensive manner.

While many may hold opinions on histology, pathology, &c., and also as to modes of treatment different from those entertained by the authors of the articles in this excellent treatise, all will agree that their work is worthy of commendation and should be greatly appreciated as a valuable contribution to dental literature. While we think it would be best to confine each writer to a definite subject and not have any conflict of opinion on similar subjects in a work of this character, there is no question concerning the value of the views expressed.

As an encyclopædia of dentistry, for we do not consider the intention was to make it a text-book, on account of its size, expense, &c., it has no superior; besides the style of the greater portion of the text is better adapted to a past graduate course than to the curriculum of a dental school, where comprehensive and abbreviated text-books are necessary for the student entering almost *de novo* into the elements of dentistry. The publishers are to be congratulated on the handsome style of the work, and the material of which the volume is composed. It should form a part of every dentist's library as the information it contains is of the greatest value to all engaged in the practice of dentistry. The remaining volumes will be looked for with great expectation and interest.

Monthly Summary.

ALUMINIUM BRONZE IN MEDICINE AND DENTISTRY.—
Professor C. Sauer, Instructor in Dentistry at the Royal University of Berlin, strongly recommends this bronze for the

under layer of teeth-plates and other purposes. It is an alloy of nine parts of copper and one part of aluminium. It admits of almost as ready stamping and pressing as pure silver, (which next to pure gold, is the softest metal), and it has, besides, the elasticity of steel. In form of wire, aluminium bronze possesses a power of resisting tension approaching that of steel wire. These characteristics render it capable of substitution in many cases for silver, and for silver and gold alloys. The melting point of the bronze is higher than that of pure gold— $1,000^{\circ}$ C. It may, accordingly, be made red-hot without danger of melting, and manipulated with hard solder. It is soldered with fourteen or sixteen carat red gold, which is more capable of resisting chemical influences than silver solder, which contains zinc. Aluminium bronze is almost one-half lighter than fourteen carat gold.

Professor Sauer has made various experiments with aluminium alloys; the zinc alloy was unstable, the zinc oxidizing in the mouth, with gold and platinum alloys the aluminium decomposed, whereas in two cases aluminium bronze placed in the mouth under the influence of a galvanic current did not, after the lapse of four weeks, suffer loss of weight. The bronze oxidizes only superficially in the mouth. There forms upon it a kind of patina, such as is formed in the wearing of plates of fourteen, sixteen, eighteen, and even twenty carat gold. It admits of manufacture into spiral springs, plates, screws, canulas, &c., for surgical purposes. Even knives have been manufactured from it. A solution of corrosive sublimate of one to one thousand affects it superficially. For its disinfection carbolic acid is to be preferred, as it does not attack the bronze. Gold aluminium bronze acts similarly, but oxidizes to a greater extent, is softer, and not so elastic, and therefore is to be used as green gold or as twenty carat gold is used.—*The Therapeutic Gazette*.

BORIC ACID AND AFFECTIONS OF THE MOUTH.—*By A. D. Macgregor, M. B., C. M.*—In connection with the local application of boric acid in various diseased conditions of the mouth, its solubility in water and glycerine, its unirritating character, its comparatively innocuous nature, and its almost

tastelessness, are greatly in its favor. More particularly is this the case in treating such conditions in children, whose oral cavities cause them so much annoyance. Speaking generally, boric acid will be found useful in all conditions of the mouth, fauces, pharynx, and nose, where there is any abrasion of the epithelium; whether it be used as a powder, gargle, mouth-wash, pigment, or confection. More definitely, I may say, it is not contradicted in any of the forms of *stomatitis*, though scarcely severe enough for the graver varieties.

IN SIMPLE CATARRHAL STOMATITIS, a mouth-wash containing from 10 to 15 grains to the fluid ounce speedily cures the condition, and exercises the same beneficial influence in the *ulcerative* form, though there, in addition to the rinsing of the mouth, a local application in the form of powder or pigment should be made to the individual follicular ulcers. The powder simply consists of finely powdered boric acid, mixed in various proportions with starch: the pigment is a solution of boric acid in glycerine (1 in 4 or 5). In both cases, the addition of chlorate of potassium is advantageous; indeed, I usually combine it, but it is not essential.

For thrush in children, I especially recommend boric acid, either as a mouth-pigment or as a confection. Honey and sugar have both been condemned, as being inadmissible, in combination, for the treatment of thrush; but, so far as children are concerned, I must say I consider a confection (though made with honey), which has been impregnated with boric acid, gains more by its palatableness than it loses by tendency of the saccharine matter to further the growth of the fungus. The boric acid at once does away with this tendency. Let the pigment be frequently painted with a brush over the patches never omitting to do it after food has been taken; or, a little of the confection, simply allowed to dissolve in the mouth; and the days of the fungus will soon be ended. I have found boric acid, combined with its salt (borax), markedly beneficial. Borax alone, however, is not nearly so good.

IN PHARYNGITIS AND RELAXED CONDITIONS OF THE THROAT, a gargle containing boric acid and glycerine, with either tannic acid or alum in addition, ought not to be forgotten.

In severe cases of typhoid fever the mouth is frequently hot; the lips dry, cracked, and glued to the sordes-covered teeth by inspissated mucus and saliva; the tongue dry or even glazed and hard, brown or black, crusted with a fœtid fur. Under such circumstances, a pigment, containing boric acid (30 grains), chlorate of potassium (20 grains), lemon juice (5 fluid drachms), and glycerine (3 fluid drachms), yields very comforting results. When the teeth are well rubbed with this, the sordes quickly and easily become detached; little harm will follow from the acid present. The boric acid attacks the masses of bacilli and bacteria; the chlorate of potassium cools and soothes the mucous membrane; the glycerine and lemon juice moisten the parts, and aid the salivary secretion.

A tooth powder should possess certain characteristics: it should be antiseptic, cooling, agreeable to taste and smell, and have no injurious action on the teeth. After use it should leave the teeth white, and a sensation of freshness and cleanliness in the mouth. As an antiseptic in this connection nothing can replace boric acid. For years I have used the following powder and can recommend it:—

Boric acid, finely powdered.....	40 gra.
Chlorate of potassium.....	half drachm
Powdered gualacum.....	20 gra.
Prepared chalk.....	1 drachm
Powdered carbonate of magnesia, to.....	1 ounce.
Otto of roses.....	half a drop

The boric acid in solution gets between the teeth and the edges of the gums, and there in discharges its antiseptic functions; the chlorate and guaiacum contribute their quota to the benefit of the gums and mucous membrane generally; the chalk is the insoluble powder to detach the particles of tartar which may be present; and the magnesia the more soluble soft powder which cannot harm the softest enamel.—*Dental Record from British Medical Journal.*

CONVULSIONS, ETC.—Convulsions may frequently be cut short, like magic, by turning the patient on his left side. The nausea as an after effect of chloroform or ether narcosis may generally be controlled in the same manner.—*N. W. Lancet*

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ARTICLE I.

SOUTHERN DENTAL ASSOCIATION.

—
EIGHTEENTH ANNUAL MEETING.

—
AT NASHVILLE, TENN., JULY 27, 28, 29 AND 30.

—
(Reported by Mrs. M. W. J.)

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[Continued from September Number.]

One after another of the sciences has been brought in till we are liable to have all the *isms* and all the *pathies* which destroy human life rather than preserve it.

The damage which has been done abroad we are not responsible for; the profession at large has nothing to do with those illegal diplomas. They have been sent abroad by disreputable institutions, but we are not responsible for that.

G. F. S. Wright, Columbia, S. C.: Will Dr. Morgan

please tell us something about the honorary degree; how it is obtained?

Dr. Morgan : It is bestowed only upon men who are highly recommended; who have made a good showing; men who have made valuable contributions to literature or science. It is only bestowed where well merited, and can do no harm to the profession.

On motion of Dr. McKellops, the subject of Dental Education was temporarily passed, the hour of adjournment having arrived.

The hour from 12 to 1 o'clock was, on motion of Dr. McKellops, set apart for the exhibition and examination of appliances, etc.

On motion, adjourned to 9 A. M.

WEDNESDAY, July 28.

SECOND DAY.—MORNING SESSION.

Called to order at 9 A. M., the President in the chair.

Adjourned to Amusement Hall, on Broad street, seeking cooler quarters and less echo.

Called to order at 10:15 A. M.

Minutes of preceding meeting read and approved.

DENTAL EDUCATION CALLED.

Dr. G. W. McIlhaney reported no other papers.

Dr. Morgan introduced Dr. Hubbard, of Mehary College, an institution for the higher education of colored people.

Dr. Hubbard said that he was glad to have the opportunity of speaking a few words relative to an institution of which comparatively little was yet known by the people generally. It affords opportunities, such as have never before been offered to the colored race. The medical department has been in operation for several years, and sixty-two graduates have gone forth, and are now practicing medicine in the Southern and South-western States. They have been most kindly received by the medical profession, and assistance given in locating.

The medical course covers three years, with daily recitations in physiology and chemistry; two hours daily for ten weeks in the clinical laboratory, etc. The examinations are rigid, 75 per cent. being the minimum. Those who fail to attain this point must re-enter for another year before they can receive the degree of M. D. A dental department is about to be opened in close connection with the medical department, with special instructions in dentistry proper, having a dental laboratory and infirmary. It is designated to do thorough educational work in this department, and the dental profession was asked to extend to graduates the same kind assistance and encouragement as have been given by the medical profession. The work of the dental department will be extremely philanthropic, the charges being only \$30.00 per session. From \$75.00 to \$80.00 will cover the whole course, including materials, fees, etc. The only requirements for entrance is a good moral character and a fair preliminary education. If students cannot pass the examination for the latter, they are entered for one year in the literary department.

On motion, the subject of Dental Education was passed.

DENTAL HYGIENE.

Dr. B. H. Teague, Aiken, S. C., read a paper on

THE PERSONAL HYGIENE OF THE DENTIST.

Dr. Woodley's paper was presented later.

No other papers being offered, the subject was opened for discussion.

Dr. G. H. Winkler, Augusta, Ga., said that he had listened to the paper with interest. He had found the best motor for the engine to be "a big strapping negro." He had tried the power-fan, but after using it for two years, he suffered for two years more from rheumatism in the right shoulder and back of the neck. The constant breeze was delightful for both patient and operator at the time, but his experience had proven to him that it was not safe.

Dr. Teague thought that Dr. Winkler's motive power would be found *too strong* in hot weather.

Dr. Winkler replied that alkali neutralizes cupric acid!

Dr. W. H. Richards, Knoxville, objected to the three meals per day, with dinner at noon, recommended in the paper. Dental operations after a full meal at noon, were not conducive to digestion. He would prefer to work on through the middle of the day, when there was a good clear light, and have a leisure dinner at six after the day's work was done.

Dr. Adair preferred a Southeastern light to the Northern light recommended in the paper; he considered that a better light and more conducive to health; as a rule dentists live too much in the shade; they should have plenty of sunshine properly regulated by blinds.

Dr. J. Hall Moore, Richmond, Va., had tried the Southeastern light, but found that his eyes suffered from it, and that it made his work harder. Preferred the Backus water motor; with it can get into every position—either side of, behind, or in front of the patient; he believed it had added ten years to his life; he would recommend it to every operator; the motor is fixed, and the engine is fixed, but the arm has the greatest freedom of range. The turbine motor is probably more powerful, with less consumption of water.

Dr. W. H. Morgan, thought the profession, as a rule, did not give sufficient attention to these little things. For fifteen years he had offered a prize of \$100.00 for the best paper on this subject; a large number of papers had been handed in, but they were all on general hygiene—not on the special hygiene of the dentist. One statement in the paper contained great sophistry—that was the value of light suppers—that is contrary to the rule of all nature; the infant sleeps soundly only when its appetite is satiated, and it is the same through the whole range of the animal creation, they fill the stomach and then rest. Man should not contradict nature. If a hearty supper disagrees it is

because of long cultivated habit; each individual should exercise prudence in diet, and be governed by what he finds suits himself best. As to light, the best light in the world is a sky light—light coming from over head; the brow shades the eyes and protects them; a light from the rear is the worst in the world. All light from behind and the side should be shut off; having the light full in the face of the patient, but not in the face of the operator. The best motor is a young intelligent assistant, a young woman decidedly preferable. Perpetual motion was not what was wanted for an engine; an intelligent assistant is an absolute necessity for a man in full practice—wanted for the engine, the mallet, the fan, to select instruments, etc—a lady is easily trained to understand the slightest motion of the head—no words are necessary; a lady is preferable because she looks at the right end of the instrument; a student looks at the point and not at the handle, and is thinking about what you are doing, not about what he has to do himself. A lady assistant will also receive and entertain patients and wait on them as a man cannot do, attending to their comfort and convenience, and keep the office neat and attractive.

Dr. E. S. Chisholm, Tuscaloosa, said that the subject of hygiene was of the greatest importance to the dentist. He should look carefully to his own comfort and ease of position, avoiding all strain and nervousness. He should occupy rooms having a southern exposure, and plenty of sunlight; light from overhead, protected by an awning was the best. In the Southern States the cool breezes come from the south and southwest, making rooms on the south side cooler in summer, though warmer in winter; a breeze through the rooms carries away all odors from the patient or from the spittoon; or of remedies used. Rooms on the second floor are preferable also—are less subject to malaria. A small light stool which can be readily moved about, allowing the operator to have a sitting position, or alternate sitting or standing, is a prime necessity. Fresh air is all

important, but a draft of air on the back is injurious. He preferred a young female assistant, as being handy, neat, cleanly, looking at the right end of the instruments, and looking to all little points of comfort and convenience of patients. Men were clumsy, rough and bungling about such things.

Dr. H. J. McKellops, St. Louis, said he had in his hand a little book entitled "Disinfectants and their Use," which was quite apropos to the subject. Enough attention had not been given to the matter of healthy rooms, sunlight, fresh air. He wished to direct attention to the little book mentioned. Peroxide of hydrogen and menthol as a mouth wash would keep the mouth clean and pure, and would remove the green stains found on the teeth of young children; is a valuable disinfecting agent used as a spray, free from unpleasant odor, and harmless. Chlorine is a more active germicide than bi-chloride of mercury, and would be found to add much to home and office comfort; it has the power of decomposing and destroying the deadly poison of the mad-dog, being a prophylactic agent against the most horrid disaster possible to man, being a *preventive* which is better than a curative agent. He wished the article on chloride would be cut out and posted in every parlor; with all our surroundings pure, sweet and healthy, we should banish disease and suffering. He always had a lady assistant, and he saw to it that she was as well taken care of as she took care of his instruments and other belongings, and every one he owned was cleaned every day; he never had to take up an instrument and look to see if it was clean.

Dr. Rembert, Natchez, said the main points of an office were light, ventilation, temperature and disinfectants. He preferred a north light. He had a male assistant for his motive power, who was also trained to select his instruments as needed; he does not use the mallet. He now uses an operating stool, but had suffered tortures unexpressible before he learned to operate sitting down. Dentists

suffer too much worry, from not systematizing their appointments, having perhaps a dozen patients waiting at once. After a day of worry there is no appetite for dinner. Six hours a day is enough except for extracting teeth. Exercise is absolutely indispensable, but it should not be excessive. An early morning ride, or a stroll is the best preparation for the day's work. He did not agree with the paper on the subject of suppers; sleeplessness is often caused by want of food; if a man would go and eat something when restless and sleepless he would probably sleep like a child. The evening should be spent in social enjoyment.

Dr. G. Chisholm, Columbus, Miss., said it was difficult for the dentist to regulate things as he would like to have them. No laws could be laid down for the regulation of all offices alike; each must be guided by his own circumstances. He believed in a free circulation of out-door air; a dozen fans with doors closed would be injurious instead of a benefit. As to excluding night air, he did not see what else we could have at night. In malarial regions out-door air was as necessary as anywhere else. For spittons, etc., he had never seen anything he liked so well as hydro-naphthal. The spitton should be cleaned and disinfected after every patient, and never left a whole day. For motive power he used a young man, who was well trained as to the use of instruments, whose duty it was to select them as wanted, to clean them, and to put them back, selecting what was wanted for each patient. He preferred a southern exposure, and thought it only necessary for one to try it a little while to be convinced of its superiority. A skylight was objectionable from the varying clouds.

Adjourned at 12 M., for the EXHIBITION OF APPLI-
ANCES.

Dr. H. J. McKellops exhibited and explained the instruments and appliances for the Herbst method, which he had recently obtained from Dr. Herbst, whose clinics he had attended. There were agate points for filling—German silver for making matrices of which he solders the ends

together around the tooth, burring open one side for removal. He cuts the point off a common pin and sticks it between the teeth to hold the dam in place. He rotates the first layer of gold in with hand power, using every form of gold, even to 60; he burrs the gold round against the walls of the cavity, and burnishes with smooth round agate points; the burring makes the gold cohesive, though he sometimes anneals it. Dr. Herbst makes his barbed broaches of 14 caret gold wire; if it breaks off it can be driven up for filling, and no sweating for hours getting out a broken broach. Amen to steel broaches! A special feature of Dr. Herbst is his utilization of all the little odds and ends of everything, displaying wonderful versatility and ingenuity; anything that he picks up is made to answer his purpose, and nothing is thrown away.

A box of specimens sent by Dr. Dunlap was exhibited, including some jaw-bones from ancient Indian mounds. Dr. J. J. R. Patrick pointed out the fact that they showed very plainly the marks of alveolar abscess, and other diseases, supposed to be due to modern civilization. In one there was the remains of a decayed tooth; in another the bony cicatrix of an alveolar fistula. The American Indian suffered from his teeth the same as the white man of to-day. In a hundred skulls it is difficult to find a perfect set of teeth.

Dr. Staples, Sherman, Texas, showed a foil folder, and crumpler or crimper; also a paper-disk carrier. Dr. H. E. Parr has separators, which are quite different from Dr. Perry's but very effective.

Dr. Morgan called attention to a book called "Dental Questions and Answers"—a valuable little *vade mecum* to aid students in reviewing lectures, being a summary of the Lectures of Dr. L. C. Ingersoll, in the dental department of State University of Iowa.

Dr. B. S. Bynus showed his improved method of regulating with gold wire, with models of cases, before and after regulating.

Adjourned to 3 P. M.

SECOND DAY.—SECOND SESSION.

Called to order at 3:30 P. M., the President in the chair.

The discussion of DENTAL HYGIENE continued.

Dr. G. F. S. Wright, Columbia, S. C., did not agree with Dr. Morgan and others on the subject of Diet; he thought the excessive feeding of infants produced an unhealthy sleep, and developed other evils. The bovine species lay down when full, not to sleep, but to chew the cud. The results of eating at certain hours depended on the individual; the heartiest meal might be taken at morning, noon or night, as each individual preferred.

Defective inspiration was one great cause of trouble; respiration was an important factor which is not sufficiently thought of. We do not inflate the lungs sufficiently.

Dr. Teague, being a very modest young man, had omitted to mention a simple contrivance of his own, an armlet by which the arms are supported while at work, giving great relief and ease. As to the light, it does not make much difference whether it comes from the north, south or west, so it falls directly on the spot where the work is to be done, and not in the eyes of the operator.

President Wardlaw (calling Dr. Catching to the chair) said it was very important to understand the use of the mouth glass in throwing a strong light on the spot where it is most needed, and also to work by the reflection in glass, not trying to see the tooth itself—in that way the operator could escape the breath of the patient, avoid the shadow of his own person, and a constrained position. It might be found a little difficult to acquire the habit, but it would be found well worth the trouble. The dentist should remember to frequently straighten up and *breathe*—they too often forget to breathe. A skylight is fine both for light and ventilation and the varying light can be readily regulated.

Dr. Freeman, Nashville, spoke of the great advantage of sitting while at work, using an ordinary counting-house stool, which can be easily moved about with the foot, or one side or the other of the patient. Heavy weight men who have not tried it cannot imagine what comfort there is in it.

Dr. W. H. H. Thackston said that he had just received a paper on Hygiene from Dr. Woodley, of Norfolk, Va., who had expected to be present, but had been prevented by a death in his family.

The paper was referred to the Publication Committee, and, on motion, the subject passed.

OPERATIVE DENTISTRY.

Dr. Wm. Crenshaw, Atlanta, Ga., read a paper entitled "A Complete System Possible in Filling Teeth;" and Dr. Solomon read a paper sent by Dr. J. S. Knapp, of New Orleans. Dr. Solomon said he was very sorry to have to oppose the paper he had just read, but he believed in leaving the nerve if only a very little piece was left. If you take a tooth just extracted, the pulp does not fill the entire cavity; in healthy children, 17 or 18 years old, there will be from two to two and a half millimetres between the lining of the cavity and the pulp; at 30 to 40 years of age it increases to from four to four and a half millimetres. He has examined many perfectly sound teeth which had been extracted in regulating, and always finds this to be the case. If a healthy living pulp is expoused, he caps and fills immediately; if diseased and not of a healthy color, but swollen and red but no pus, he makes a very little puncture, treats with eucalyptus and iodoform for a few days, then caps and fills. If there is pus formation, he resorts to the old method, taking a sharp spoon-shaped excavator, and cutting out as far as possible. He then touches the pulp with a white hot instrument, so quickly that it is entirely free from pain; this treatment covers 50 per cent. of diseased pulps; no discoloration follows, and very rarely

alveolar abscess. If necessary he would treat for weeks or months rather than destroy the least possible portion of live nerve. He makes a paste of calomel, oxide of zinc, and glycerine, which he pushes gently into the pulp chamber. Has seen outrageous results from the practice of Dr. Knapp in driving wood into the pulp chamber. Had one case where the patient was suffering agonies from wood driven in with a mallet; periostitis was severe, and relief not being obtained the tooth was extracted, when the wood was found extending through the end of the root; the exact length of the root cannot be measured; if the root is long, part of the nerve may be left untouched; or the wood may go beyond the apex if the root is short; he did not think it would succeed in 25 per cent. of cases.

Dr. Louis Dotterer said that, as the pulp sends out filaments into the dentine, he could not conceive how there could be any space between the pulp and the dentine, though the nerve might withdraw if killed in a vacuum. He did not approve the idea of cutting off part of the nerve; he should imagine it would be terribly painful, and would not like to have it tried on himself.

He could not agree with Dr. Crenshaw that cohesive gold was the best; soft foil was so congenial to the cervical margin, but he would add cohesive to finish; soft foil would lap well on the edges.

Dr. J. J. R. Patrick said a great deal was said about different kinds of gold, but gold was gold the world over; there is a great deal that is unnecessary and important said about the distinction between hard gold and soft gold, adhesive and cohesive, etc. If there is any difference between gold and gold, it is due to some alloy; something smeared over the surface; all that is sold as gold is not pure gold; there may be a slight addition of silver. Annealing gold makes it more tenacious, and a corner can be built out better by passing every pellet over a spirit lamp before putting it in the cavity.

Dr. McKellops wished to ask Dr. Crenshaw whether

he had ever used any other mallet than the electric—Bonwill's mechanical for instance.

(Dr. Crenshaw said that he had tried them all.) Dr. McKellops said that he had one of Bonwill's first; had tried an electric mallet made in Philadelphia by Dr. Jack; had seen Dr. Jack operate with it, and had seen Dr. Bonwill use his—had been the best of friends with Marshall Webb—he always has the best money can buy, and the best of materials; had proof gold tested, from the mint of California, at \$50.00 per ounce. Had wanted to make a success of the electric mallet, and liked it very well in some cases, but could not do as delicate work with it as with Bonwill's. He had seen the worst results from wedging; a front tooth lost, the whole socket being ruined by rapid process—by gradually opening with tape, in five or six days you have all the room wanted without soreness. Want of care and time will always produce disastrous results. What he had been watching lately, done by "that man from over the water," looks as if it was going to be the coming thing. It requires a little care; a man must discriminate between right and wrong, and not slobber over his work. The new method (Herbst's) offers great protection for thin walls, lapping over and protecting them well. The use of his matrix saves over half the cutting in finishing up, and saves material. It is a good thing in proper hands. All do not work alike, but would not condemn a method because it is "not my way." My friend Brown works very differently from me, but he does as pretty work as ever man did. We cannot say this is *the best* or this is *the only* way. Each must work out his own individuality. Would not like to undertake the method described by Dr. Salomon, and has never found the shrinkage described by him; finds the pulp sometimes prominent in the branches of the cusps; there is no shrinkage of pulp in young teeth, it is only in old age, and then the space is filled up by tooth bone, following the shrinkage up closely.

Dr. Morgan wished to ask Dr. Patrick why he would anneal his gold, piece by piece, a second time, when it had already been annealed in the manufacturing?

Dr. Patrick said that even if previously annealed, there were surface accumulations, and moisture that required to be drawn off before it was ready for use.

Dr. Morgan: Dr. Patrick said that many teeth were preserved, and gold fillings made with soft foil, but they were not equal to cohesive gold fillings. A few days ago I looked at fillings I made in 1848, and which are still standing without a flaw. Do you want anything better than that?

Dr. Patrick: When gold is rolled or beaten, the molecules are compressed and made smaller. They expand again to their natural form when annealed, and we use the mallet to compress and draw them together again, producing greater solidity than if we attempt to drive unannealed gold. Annealed is more compressible.

Dr. Beech was sorry to find so few disposed to advocate the virtues of non-cohesive gold. The fillings made by Dr. Morgan have stood the test of forty years! Dentistry is a conservative profession, but the man who claims that he must have a specific gold, of a specific character, to make good operations, takes a narrow view. To make the best operations it is necessary to be able to combine the best materials and the best methods. It may even be necessary to use cohesive and non-cohesive, interchangeably, in the same cavity to make a perfect operation; we must use whatever is necessary to obtain the best results. In a large majority of cavities we need a combination. Do not like the terms hard and soft for gold. When you say cohesive and non-cohesive, it explains itself—one slides and one sticks. A man who confines himself to one material deprives himself of many advantages in the salvation of teeth. Root canals can be filled with wood or gutta percha, or oxychloride, or gold or tin; it makes little difference which, so that it is perfectly filled. For fifteen

years I have advocated filling with lead, and have yet to find a failure. There is a chemical reason for this. A lead bullet will not cause suppuration; nature tolerates it, and this is true of a lead root filling, even if driven through the foramen. A spindle of soft lead can be driven in and so battered down, as to make a perfect root filling.

Dr. Winkler said he early made it his motto to learn to operate after the method of every good man, for each one had his own method. He said that Dr. Beech had stolen his thunder, and made his speech on that point. It was ever thought that the height of scientific skill had been attained when a tooth was filled with soft gold. All cohesive gold required an operator of exceptional skill; but the two conjoined filled every requirement, Defend the cervical walls by putting in soft gold; when within 1-16 of an inch of the edge, weld on cohesive gold and contour. Many able operators were looking in every direction for some non-conductor with which to line cavities to be built out on the surface with gold. Tin foil at the cervical margin protects from all danger of leakage, or of fracture with the mallet, but tin foil darkens the teeth. A subsequent operator seeing this dark streak might think it a renewal of decay, but on testing would find both filling and tooth perfect. Dr. Webb probably pronounced tin foil the most difficult material to fill with, simply because he had not used it enough to know the contrary. There is nothing so easy to work, but it requires peculiar manipulation.

Dr. Patrick asked Dr. Winkler to name the difference between soft foil and adhesive gold?

Dr. Winkler said that only, that one would slide on itself—the other would adhere.

Dr. Patrick said it was only necessary to anneal the gold, drive off all moisture, to make it adhere.

Dr. Winkler spoke of the different methods employed by different operators—the electric mallet, hand pressure, the lead mallet, minutely serated instruments, or polished agate or ivory points,—and yet each one may make beauti-

ful work. What is perfect for one will not suit another at all, and each one must choose what suits his capacity best.

Dr. Morgan said he was very glad to hear the statement, or the inference from the statement made, that all gold was chemically the same; that cohesive and non-cohesive simply grows out of the relations of the molecules. Pure gold is cohesive; non-cohesive gold is not clean, not pure. Dr. Dwinelle has used only sponge gold for many years. In soft gold there is not such perfect adhesion; small particles scale. He did not agree with what had been said about lead. A tooth without pulp was dead to all intents and purposes, only the cementum being nourished. As to the root filling acting as an irritant, and requiring toleration, it might as well be put in a body, as far as coming in contact with living tissues is concerned. The life of the dentine was destroyed with the pulp; the cementum stands between the dead and the living, and makes no complaint.

Dr. McKellops asked what were the chances of success where a tooth is extracted and the cementum pared off, shaping the tooth to fit a socket made to receive it, as described by Dr. Younger, of California?

Dr. Morgan thought that if the root was well polished nature might tolerate it, by encysting like a bit of steel or gold in the hand. It might be tolerated, or it might be ejected like a splinter. In any case the tooth must be thoroughly divested of all septic conditions.

On motion adjourned to 9 A. M.

THURSDAY, July 2nd.

THIRD DAY.—MORNING SESSION.

Devoted to clinics, (in lower hall, Watkins' Institute.)

Dr. G. H. Winkler, Augusta, Ga., filled a second superior molar, buccal and crown cavity, with non-cohesive foil, using old style forcep-pluggers for condensing his

gold, giving great power with ease, to the operator, and safety to the patient. Dr. Winkler also filled proximal cavities in the central incisors, the fillings scarcely showing in the front.

Dr. W. H. Richards, Knoxville, Tenn., filled a second superior molar, crown and buccal cavity, using the hand mallet, soft foil, smooth pluggers, and Justi's speculum or reflector. The rubber dam was secured in place between the teeth by beads passed on the ligature.

Dr. How, Philadelphia, exhibited the appliances for his crown and bridgework; Dr. J. R. Knapp, New Orleans, his crowns and blowpipe; Dr. J. J. R. Patrick, his apparatus for the expeditious manufacture of gold crowns; Dr. M. W. Williams, Hopkinsville, Ky., his new motive power for engines, lathes, etc.; Dr. B. H. Teague, Aiken, S. C., his depressed disks, for dressing contour fillings, and thick rubber disks to place on the ball of the thumb, used in polishing rubber or other plates; Dr. B. S. Byrnes, Memphis, Tenn., a double clamp for holding bibulous paper in place, instead of employing the rubber dam for simple operations; also a finishing burr for cutting off roots for the attachment of crowns—a burr which can be guided like a pen, and passes under the gums without wounding the tissue.

THIRD DAY.—3 P. M.

Called to order by the President.

Dr. F. S. Chisholm, acting secretary, read a communication from the faculty of Vanderbilt University, inviting the members of the Association to visit the grounds and buildings.

On motion of Dr. James Johnston the invitation was accepted, and a resolution of thanks ordered.

The discussion of

OPERATIVE DENTISTRY

was continued. Dr. Catching recommended the reception of a paper from Prof. Gorgas, on the subject of Dental

Education. The paper was read by title and referred to the publication committee. The subject of Operative Dentistry was passed, and

HISTOLOGY AND MICROSCOPY

called. Dr. E. S. Chisholm read the only paper, and the subject was opened for discussion.

Dr. Chisholm said he wished to make an explanation. There seemed to be a disposition to receive opinions rather than ask demonstration, but we should guard well that point, and demand demonstration, not statements; we have all heard the statements made about pus exuding around the gums; it may be pus, and it may not be.

Dr. Freeman said that he did not profess to be posted in microscopy, but he had a very nice specimen of tooth-germination, showing the papilla, colored with chloride of gold.

No further remarks being made, the subject was passed and

PATHOLOGY AND THERAPEUTICS

called.

Dr. R. B. Adair, Gainesville, Ga., was introduced by the President as an expert in the treatment of pyorrhea alveolaris, but who, not having been able to find a patient for his promised clinic, would take the floor and explain his method.

Dr. Adair said that he had not come prepared to read a paper, and still less to make a speech.

Riggs' Disease was so common in some parts of the country that it was very important to have a thorough knowledge of its etiology and pathology. At his own home it was so common that he could show half a dozen cases at any time. He congratulated Nashville on its apparent rarity. He began the experiments, of which his present very successful mode of treatment is the result some eight years ago. Riggs' treatment was entirely surgical, which is good as far as it goes, but will not restore lost

tissues. The pockets still exist, and food will continue to be forced down into them, keeping up irritation. Many experiments have been made for the protection of the parts, as plates, rubber dam, sponge grafts, etc., but all fail more or less.

Dr. Adair claims to have a remedy that meets all requirements. His treatment is as follows:

A few crystals of iodine are dissolved in enough pure wood creosote to make a saturated solution, which improves with age. This is applied down in the pockets and all over the suppurating surface. It destroys all germs and stimulates to healthy action.

A glyceride of tannin is made by packing in a small wide mouthed bottle as much crystals of tannin as it will hold, and adding enough glycerine to dissolve it, making a very thick solution. Drying the parts, this is applied all over the surface, and seals up the pockets, protecting them perfectly for twenty-four hours; the saliva flowing over forms a tannate of albumen, forming a pellicle which resists friction. The application of the two remedies must be made every day, the pellicle being first peeled off, application continuing till the pockets are filled up, and the outline of the gum restored. This will take from 10 to 120 days according to the severity of the case. He has had perfect restoration where the breath was so bad that it was necessary to disinfect the office.

Dr. George Eubank asked if he would look for success in a case where the periosteum was destroyed two-thirds the length of the root?

Dr. Adair said he should feel confident of success. In reply to a question, he stated that tincture of iodine would not answer.

Dr. B. H. Catching said that he knew of Dr. Adair's great success, but that he succeeded, also, by a different method. He believed there was always caries of the margins of the process, and that it was necessary to trim that away very thoroughly first, and then apply aromatic

sulphuric acid. Then (being governed by circumstances) apply the iodine, or chloride of zinc, forty grains to the ounce. For each case he purchased a sable hair brush, (*not* camel's hair,) writing the name of the patient on it, and burning it when the case is dismissed. Every part can be reached with this brush without irritation.

Dr. G. Chisholm, Columbus, Miss., succeeded very well with Dr. Adair's method, when patients could be induced to return for treatment, but they were very apt to stay away as long as comfortable. He prescribed, in addition, a mouth wash, as follows:

Crystal iodine,	gr iij;
Tincture aconite,	3 iij;
Myrrh,	3 j;
Tannin,	grs x;

Alcohol sufficient to make 3 ounces, and flavored with wintergreen.

Use a few drops on the brush, without water. This keeps the mouth in good order; and as more pus forms, the main point is to remove all debris and necrosed and bone. Nothing equals the tannate of glycerine for protection. The salivaflowover forms a tannate of albumen which keeps all foreign substances out.

Dr. Salomon asked if he had ever cured cases caused by uric acid? *

Dr. Adair said that he did not know whether or not it was caused by uric acid, but his treatment always succeeded. He thought the disease was sometimes local, and sometimes hereditary. He had not studied the etiology thoroughly.

Dr. Morgan said it was fundamentally important to get at the pathology. It was a fundamental principle to remove the cause. Unless this was understood, the practice was purely empirical, quackish. Those who are successful should give their views of the pathology and cause;

* As suggested by Dr. Reese, of Galveston, in a paper read before the Louisiana Dental Association, in New Orleans, in 1885.

otherwise we are wandering in the dark. But he did not mean to say that the gentlemen who had spoken were quacks, or were practising from that standpoint.

Dr. Catching said that he was not speaking of the pathology of pyorrhea—only of Dr. Adair's successful treatment.

Dr. Crawford said that he believed the disease had its origin, primarily, in the cementum. The pericementum was the first structure to make outcry, though he was not prepared to say that the primary lesion was in the cementum. The great trouble in his mind was to differentiate between true pyorrhea, and local trouble, or the result of pure automatism. If the disease depends on constitutional or dietetic conditions, we must go beyond local or topical treatment, and build up the constitution by general treatment. Mere palliative measures, or attempted restoration of the parts, will not prevent their recurrence. If we have the destructive type, depending on constitutional causes, or hereditament, a cure is beyond the range of our abilities. If traumatic in character, and amenable to surgical treatment, nothing is better for healthy granulation and new tissues, than to wash out, dry with absorbents, and touch with pure carbolic acid. Has never had as satisfactory results from iodine as from carbolic acid.

Dr. Thackston said that he must be pardoned for referring to the pathology of half a century ago. He was the only one left to represent the doctrine then taught in the Baltimore College—taught by such astute, careful observers, as Horace Hayden, one of the fathers of American dentistry. After years of patient investigation of this disease, not known then as pyorrhea alveolaris, nor as Riggs' Disease, his idea was that it was a conjoined supuration of the gums and alveolar process. He taught that while local, it was a local manifestation of constitutional disturbance; vitiated and impaired nutrition of the general system. The treatment must comprise and embody the building up and repair of the whole body; to keep in

abeyance the ravages of that disease for which there was no radical cure, in his opinion. After patient employment of all the remedies suggested, he concluded that conjoined suppuration of the gums and alveolar process could never be cured, though it could be abated, modified, or palliated, with the co-operation of intelligent, careful patients. The success of more modern systems of treatment, dating from the teachings of Dr. Riggs, is a long ways ahead of anything done by Hayden or students of that day. He was undoubtedly entirely correct in the removal of all local causes; the tonic treatment of to-day was also more reliable and the true method. These gentlemen appear to have fallen upon a combination which is wonderfully successful, and adds greatly to our resources; all honor to them, though I still cling to the idea of combining general with local treatment, as remedial and alterative, with surgical treatment also necessary.—*Southern Dental Journal*.

ARTICLE II.

MEDICAL EDUCATION FOR DENTISTS, AND DENTAL EDUCATION FOR PHYSICIANS.

READ BY B. H. CATCHING.

[Before the Southern Dental Association.]

Dentistry as an art has made wonderful progress. Dentistry as a branch of medical science had advanced very slowly. The establishment of distinct schools for the purpose of teaching dentistry, and the creating of a separate degree were mistakes that have, from their inception, been drawbacks to our advancement in medicine. It would have been better when we were denied the privileges of medical

colleges, to have established schools of medicine and taught the whole course, conferring the degree of Doctor of Medicine, instead of going apart and establishing distinct schools and creating an independent degree.

It is true that we have attained some distinction, which has been done by persistent labor at great disadvantages. This limited distinction was not acquired through those who depended alone on our schools, but on advantages obtained in schools where medicine as a whole is taught.

For fifty years we have been endeavoring to persuade the world to believe that we are specialists in medicine. That they have been so slow to believe it, is not remarkable when we consider our foundations for such assertions.

It is an unreasonable request to make on our part, when we neither teach nor graduate as such, and continue to work under creatures of our own, in which medicine plays so small a part.

I do not wish to be understood as striving for medical recognition, though that would be laudable. But I do wish to be understood as desiring to place dentistry on a plane where it will command the highest respect of the people and have accorded to it its full sphere of usefulness. It is commonly believed that the only requirement necessary for becoming a dentist is a mechanical turn of mind, and that the only education necessary is to develop and train such a mind.

This, I am sorry to say, is not alone the opinion of a large majority of the people, but of a vast number of dentists who have been taught and practice simply the mechanical.

Our separate schools and degree have forced this conclusion on the people, and we can never change it until we change our system.

Surgery is mechanical, but it is not vulgarly accepted as a trade, because it carries with it and is intimately associated with medicine. As with surgery, so with dental surgery, if we were alike possessed of such knowledge.

If we wish to be a part of medicine and surgery, we must accept teaching necessary to qualify us for it. We must do away with separate schools and the distinct degree. We must educate and graduate from regular medical schools under one common degree.

Separate schools do not create that desire necessary for the successful prosecution of a learned profession. Their teaching is too limited for expanding the mind to nobler and higher attainments.

How can we claim to be practicing a science so high and so broad and so grand of which we hardly know the first principles?

In theoretical medicine we are taught to a very limited degree, while in clinical medicine we are not taught at all.

The establishing of boards of different kinds clearly indicate our lack in this respect. And while they may accomplish some good, yet it is not to them that we are to look for relief.

The plodder will be content with our limited teaching, but the progressive and ambitious will look elsewhere for that knowledge not obtainable in our institutions for the proper prosecution of a branch of the healing art.

It was thought, when universities established dental departments, that every requirement had been met. When they are conducted in connection with the medical departments they are an advance toward better medical teaching, but when they are conducted apart from the medical departments they are no better than dental colleges, and are, in fact, nothing else.

Admitting this to be an advance, we must not stop here. Humanity demands that we prepare ourselves more thoroughly for healing her ills and correcting her defects. Shall we longer refuse this demand? Can we afford it? I say not. We must have every advantage offered for the highest education in a calling so nearly related to divinity itself.

I will say in conclusion: do away with dental colleges;

do away with university departments; do away with the degree of D. D. S. Return to the reputable medical colleges, enter and come forth as doctors of medicine, and then enter a dental infirmary in which the highest type of practical dentistry is taught, and then we will stand fully equipped to practice dentistry as a specialty of medicine.

I do not wish to convey the idea that we should accept the teaching of every medical college; far from it. There are too many of them nothing but catch-penny establishments, caring little for the manner of their teaching, and less for the qualification of their graduates. While we are not here to read lessons to medical colleges, yet we can appropriately urge them to establish chairs of dental surgery and teach it as applied to medicine. It would not only be a vast benefit to the physicians so taught, and a blessing to the people, but it would cause a higher appreciation of educated dentistry, and redound to our good as well as to their glory.—*Southern Dental Journal*.

ARTICLE III.

IMPLANTATION OF TEETH AND
PERICEMENTAL LIFE.

BY WILLIAM J. YOUNGER, M. D.

[Read before the California State Dental Association.]

Mr. President and Gentlemen:—

Dr. Warner, Chairman of the Committee on Surgery and Pathology, did me the honor to say, to-day, that the only new thing in Dental Surgery, that he was aware of, was the successful transplantation of teeth into artificial sockets by Dr. Younger, one of the Committee; several of

which operations had been witnessed by himself, and the success of which he could vouch for. He, therefore, delegated to Dr. Younger the task of making out the report of the Committee. Had Dr. Warner informed me of this intention sooner, I should have been able to present to you a report fuller in detail and more free from crudities than this, of necessity, must be.

Transplantation and Implantation, as I call my new operation, has so far realized my most sanguine expectations, and leads me to the belief that in a short while it will become as firmly established in professional practice as any other operation requiring skill and judgment.

Since the publication of my brochure on "Transplantation of Teeth into Natural and Artificial Sockets," which you have all seen, and a portion of which formed a report made to this Association, at its last session, I have made a discovery in regard to the vitality of the pericementum, that is even more startling than the success of the operation of Implantation itself. In the pamphlet I recommended the use of cock's combs as a means of preserving the vitality of the peridental membrane, and also mentioned that in two instances the life of this membrane had been preserved for over fifty hours, in tepid water. I now, however, have to report a case—one of several—which proves that these means are not at all necessary to preserve the vitality of this, the most wonderful tissue in the human body; that this vitality of the pericementum is marvelous; and that it may be as tenacious as that inherent in the seeds of plants.

In the early part of March, 1886, Mrs. Dr. H. G. Blankman—the wife of one of the pioneer dentists of this coast—brought me a bicuspid that had been extracted at her solicitation, in Sacramento, on the 31st day of January, 1885, in the belief that it was the seat of a neuralgic pain, which had been the cause of great anguish to her. This tooth, brought to me after this long lapse of time, had in the meanwhile been carried about in her portemonnaie,

stowed away in her jewel case and shuffled about in her bureau drawer. And this tooth she wanted replanted in her jaw! My first impulse was to laugh, my next to argue with her about the impossibility of success of such an operation, explaining to her that it was due only to the vitality of the membrane covering of the root that the operation owed its success; that, without this living membrane, the tooth was as impossible of attachment as so much bare ivory or porcelain; and that while I had succeeded in keeping this membrane alive for over two days, it was by constant immersion in warm water, at a blood temperature; but that the pericementum of this tooth was, as she herself could see, as dry and shriveled as parchment, and as devoid of life.

Just as I had persuaded her of the impossibility of success, there flashed through my mind a passage in John Bell's work on the "Anatomy and Physiology of the Human Body," that I had lately read, which awoke the suggestion that success in implanting that tooth was, after all, possible.

This eminent surgeon, in criticising an article of the famous John Hunter, says: "How can such vitality exist independently of a circulation? But there are not wanting examples of an obscure and low degree of life existing in animals' ova, or seeds, for seasons without a circulation; and if for seasons, why not for a term of life?"

While this passage did not bear directly on the subject in question, it somehow awoke a train of thought that led me to the conclusion, that in that dry, shriveled membrane there possibly lay lurking a dormant life, which under favorable conditions would rouse its energies and make the tooth enclosed once more a living, useful organ.

I had proved that the peridental membrane possesses a wonderful tenacity of life, in at least two instances, where after it had been removed from all life-giving connections for fifty-two hours, it was as vigorous in forming attachments as though it had been planted immediately after re-

moval. I therefore reasoned with myself, if this peridental membrane preserves a vitality unimpaired for fifty-two hours, why not for so many weeks or months? So I said: "Mrs. Blankman, the idea has just occurred to me that what you want done is, perhaps, possible." And I explained the cause of this revolution of opinion, as she is not only a brave but a very intelligent woman; and continuing, said: "I will perform this operation as an experiment, to test the vitality of the pericementum, for, though I have no positive expectation, I have a hope of its success." So, on the 11th of last March, in the presence of and with the assistance of Dr. Alexander Warner, who was acquainted with all the circumstances of the case, I drilled a socket between the first left superior bicuspid and first molar; and after soaking the tooth in water—temperature 120° Fah.—for twenty-five minutes, to soften the membrane, restored to the jaw that which it had been deprived of just thirteen months and eleven days before.

As the dental aspect of the tooth was perfect, and the approximal not nearly so much so, I turned the tooth, thereby much improving the original appearance of that portion of the mouth. When the operation was finished, the tooth was found so firmly fixed in the socket that retaining ligatures were not applied; and union took place as rapidly and as thoroughly as if it had been a fresh tooth.

The tooth retaining this firmness and no swelling nor pain ensuing, the lady commenced eating with it, and at the end of twelve days became so careless in her use of the tooth, that she bit a hard crust of French bread with it. This was too much; the tooth received a wrench that loosened it and caused the gum to bleed profusely. Next morning she hurried to the office, and with tears in her eyes, narrated the accident. I found the tooth quite loose, but not dropping, and the gum on the palatine surface swollen, and with the evidence of having bled at the margin.

In my heart I was glad the accident had happened; for to me it was a test of the question whether the retention of the tooth was due simply to the nice adaptation of the walls of the socket to the root of the tooth, and therefore only mechanical, or whether it was really due to awakened life in the peridental membrane, and consequent vital connection with the living environment of gum and alveolar substance.

If mechanical, I argued, the irritation that has been set up around it, especially in its present loose condition, will cause its expulsion; but if vital, it will be retained and become firm again. I therefore did not seek to retain it in place by any ligature, but simply painted the gum with tincture of iodine, and cautioned her not to chew on that side until I gave her permission. In one week all marks of the accident had passed away; the tooth became again firmly fixed, and remains to the present moment as solid as a rock. I have tried, since then, to pass a delicate instrument, the point of which had been flattened for the purpose, between the gum and the tooth; but the act gave as much pain, and the instrument met with as much resistance, as in the tissues surrounding the teeth that had never been disturbed in their sockets; all of which clearly proves that the pericementum of that tooth—dry and shriveled as it was—had during those long months of absence from any life-supporting substance, tossed about from place to place, from pocket and purse to casket and drawer, preserved a vitality as fresh and vigorous as when it was removed from the place in which it grew.

I am happy to say that Mrs. Blankman has kindly consented, in the interest of science, to present herself to you this afternoon, in order that you may examine this tooth, and satisfy yourselves by personal and thorough examination, as to the success of the operation. And I want each and every one of you gentlemen to test in every way that your ingenuity may suggest—short of extraction—the statement I have made, that vital connection has been

established between that tooth and the walls of the socket, as perfect as that of the other teeth that have grown there and never been tampered with.

I have since tried implanting teeth which have been extracted for weeks and months, with equal success, proving the wonderful tenacity of life in the peridental membrane.

The question now in my mind is: "When does the pericementum die?"

In consequence of these experiments, and the equal success of the implantation of long extracted teeth with that of fresh ones, I have discarded, as unnecessary, the warm water and the comb of the troublesome cock.

I now simply lay the teeth aside in a clean, cool, dry place, and prepare and use them as I want them.

I have also discarded the flat drill, and use, instead, graded trephines for piercing the bone and for doing the major part of the work; finishing the walls, as formerly, with burs of various shapes.

Much doubt has been expressed by the profession in the East and elsewhere as to the stability of implanted teeth, because the kindred operations of Replantation and Transplantation that have come under their observation, and which, at first, gave promise of permanency, have so generally turned out failures in one or two years, from absorption of the roots. They argue that if Replantation, which is the putting back of a tooth into the socket from which it has been but just drawn; and Transplantation, which is the planting of a stranger tooth into a socket from which its own has been but freshly extracted; if, they say, these cognate operations, where the conditions seem so much more favorable, in consequence of the sockets being natural, are so generally failures, what better result can be expected from an operation where the socket is formed by violence to the jaw?

Now, if they would but consider the conditions and circumstances under which these different operations are

undertaken, they would readily see that the premises upon which they ground their assumption are unsound and deceitful. For instance, in replantation, as this operation is usually performed, the parts—that is, the peridental membrane, the apex of the root and the alveolar process immediately surrounding these—are highly inflamed, in a state of disease, with pus either already formed or forming at the end of the root, and the operation is undertaken with the view of relieving or aborting an alveolar abscess. A portion of the diseased apex is then cut off, and the tooth is forced back into the cavity. Here we have a diseased root thrust back into a diseased socket. The disease is not removed, its conditions are simply modified; and while the congestion may subside, and the tooth become comparatively comfortable, the disintegration of the root substance—already begun—is likely to continue, and in the course of time the entire root becomes destroyed, or, what is called absorbed; and the bodiless crown drops off. So much for Replantation.

Again, in Transplantation there is a healthy tooth, but it is usually made to take the place of a miserable, old, diseased root, that has been growling and festering in a diseased socket for years, to the discomfort of its unfortunate possessor. The diseased root is pulled out, but is the disease in the surrounding alveolus extracted with it? On the contrary, enough is usually left in its tissue to make war upon the new occupant, and either cause its expulsion, or eat away its substance. You must remember, that while the old root remained, there was sufficient vent through its decayed or broken structure to permit the gases of decomposition and the pus to escape, and thus prevent active trouble. But when the new tooth is put in, the vent is entirely occluded, and if there be sufficient disease in the alveolus, the retained gases and pus effect the expulsion or the painful elongation of the intruder. If not enough disease is left to do this, then the slow process of erosion is apt to ensue, and the root becomes, in time, absorbed.

Now, in *Implantation we have a healthy root in a healthy socket*; and therefore, the factors that tend to the destruction of the root in Replantation and Transplantation are not present, and, therefore, not operative in Implantation.

As to the seeming violence to the bony structure of the jaw, I will state that there is no substance in the human body that seems so tolerant of abuse as this same alveolar process. And my experience is, that union takes place more readily and kindly, and the teeth become much sooner firm and serviceable in Implantation than in either of the other operations.

I trust, my brother practitioners, that what I have read to you will serve to dispel whatever gloomy forebodings you may also have entertained, in considering the future of Implantation, and that you will apply yourselves at once to master this operation, for the benefit of your patients and of yourselves. Also, I urge on you the practice of Replantation and Transplantation, for they can be made uniformly successful, if you but follow the system I have made you acquainted with, and the primal rule of which is, to allow no disease to remain in socket or in root. Do not wait half a lifetime, as the pessimists in the profession would have you do, in order to find out if the operation is going to be successful, but commence now.

In this paper I have summarized these operations as performed by our Eastern brethren, in order to make their argument as effective as possible, and so to impress upon you the reason of the failure of Replantation and Transplantation, as practiced by them, and to demonstrate that to the disease left in the socket and root, or in the socket alone, must be attributed the failures caused by absorption of the root; otherwise, why should the result of my experience in these operations be so different from theirs? In all my practice of these kindred operations—and it has probably far exceeded that of any other practitioner in the United States—I have had but one case of non-success, due

to the absorption of the root. As it has a lesson in point, I will narrate it.

In this case, the tooth inserted was but poorly covered with pericementum, and the socket had been diseased for eighteen years, and was, moreover, so much larger than the root that the tooth had to be held in by ligatures. The evening after its insertion, the ligature loosened and the tooth fell out and dropped on the carpet. The gentleman placed it immediately back in the socket, and being unable either to tie it or find me, retained it in a position by closing his jaw and keeping his teeth tightly pressed together by means of a handkerchief passed under his chin and tied over his head. At nine o'clock the next morning I found that attachment had already taken place, which assured me that it had not been fatally injured by the episode of the night previous. I therefore renewed the ligatures, and when the gentleman started for his English home, two months later, the tooth was well attached, though not firm. This operation was performed March 2d, 1885; and a letter, dated more than a year later, informed me that the crown had broken off, and he was puzzled to know why it should have done so, when he was not cracking nuts with it! He also wrote that the fangs remained imbedded; but in this he must be mistaken. It is, in my mind, a case of absorption of the roots.

It is the only case where I did not either cut out the disease nor treat it sufficiently long to satisfy myself that it was all gone from the socket; and it is the only tooth I have lost by absorption. I may say that in cases like this, where the size of the socket is in excess of the diameter of the root, either from natural causes or alveolar disease, I form an artificial root of gum shellac, of the shape and a trifle smaller than the body of the root to be inserted; to which I attach an artificial crown. This is inserted into the socket in the direction the new tooth is to occupy, and there given temporary lodgment; by which means the margins of the gums and alveolus are kept from retracting,

the socket made healthy, and the granulations allowed to fill the cavity, until there shall be perfect contact with the whole surface of the new tooth, which I then put in.

ARTICLE IV.

"MUCH OR LITTLE WATER IN VULCANIZING?"

I noticed recently in one of our leading dental offices that in vulcanizing a case the boiler was filled nearly to the brim with water. If those who still follow that method would put but a half-dozen spoonfuls in a steam-tight boiler, even placing something under the flask to keep it from the water, they may discover three advantages in the device; a tougher plate; absence of much disagreeable odor, and models and investments disintegrated. Give a little longer time for vulcanizing by this method. Those who offer new machines for accomplishing this purpose may not thank me for this suggestion.—*Dr. F. W. Williamson, Redwing, Minn., in Items of Interest.*

The above clipping gives advice which is right in one sense, and wrong in another. A series of recent experiments not yet fully completed, seems at this time to raise a serious doubt as to whether a piece of rubber vulcanized in steam and above water can be distinguished by its texture from another piece of the same rubber, properly vulcanized under water. The caution extended to "give a little longer time for vulcanizing," gives the clue to the superior qualities, if any there be, to the steam-vulcanized product. The mixture of air and steam, usually included in a "steam-tight" boiler, is not so good a conductor of heat as is pure steam. The flask will not be as hot by several degrees when resting in the steam-space as when placed under water, and it is undeniably the fact that a low temperature and long time produces the best results in vulcanizing.

Hence, if two flasks are placed in the same vulcanizer, one in the water and one in the steam-space, there will be quite a difference in the quality of the rubber vulcanized in them, both being subjected to the same time, and apparently the same heat.

Some of the first dental vulcanizers made, dating very early in the sixties, consisted of a boiler with a separate vulcanizing chamber above it, the flasks being thus placed in an atmosphere of steam, all condensation at once descending to the boiler. It was deemed a long step in advance when it was found that a single-chamber vulcanizer would answer all purposes, the vulcanization being done as well under water as in steam.

It is probable that the practice of covering the flasks with water arose from its being found that there was less difference in the hardness of the rubber in the different flasks when this was done. It is a well-known fact that such a difference exists, and is quite noticeable when the contents of the upper and lower flasks are compared, when three flasks are put in the vulcanizer, one above the other, even when all are covered by water. The reason for this difference is, that water is a poor conductor of heat, its temperature being equalized mainly by circulation or "convection." The space between the flasks and the walls of the vulcanizer being narrow, circulation of the water is necessarily obstructed to some extent, and the lower flask, receiving the heat directly as it is transmitted through the bottom of the vulcanizer, becomes a few degrees hotter than the upper one.

Now, if these three flasks were placed in the vulcanizer with "a few spoonfuls of water," this difference of temperature will be no less, but rather greater, if they were in an atmosphere of mixed air and steam. If precautions are taken to expel all the air, the temperature will be uniform throughout the vulcanizer, and the vulcanizing uniform in all the flasks. As vulcanizing is usually done, with more or less air included in the vulcanizer, the actual temperature

of the water may be as much as twenty degrees higher than the indication of the thermometer, which only gives the temperature of the vulcanizer cover upon which it is fixed. This is shown by the fact that a steam-gauge and a thermometer, mounted upon the same vulcanizer, cannot be made to agree in their indications unless all air is expelled from the vulcanizer.

A very important factor in doing good vulcanizing, is an even temperature; any sudden variations are sure to be shown in the quality of the work. Spongy rubber is sometimes caused by a sudden fall in temperature and pressure. This is one of the principal reasons for the uniform excellence of the work done by the gas-regulator, as this device automatically keeps the temperature at the desired point when it has once been attained.

There is a good reason for not filling the vulcanizer too full of water, aside from any effect on the vulcanizing process. If there is not sufficient steam room above the water, its expansion by heat will cause it to blow out the safety disc before the vulcanizing point is reached; or, in an extreme case, if there is no relief, the vulcanizer may burst under the strain. This is an entirely different thing from steam pressure; there will be no explosion, but the vulcanizer will give way and relieve the strain.

Water is not perceptibly elastic, and its expansion by heat in a chamber which it perfectly fills will give rise to a tremendous pressure, which, however, will be wholly relieved by a slight yielding of the walls of the chamber, or a small escape. A Whitney vulcanizer was once returned to us with the sides of its pot stretched to a quarter of an inch greater than the original diameter. On inquiry it was found that it was the effect of several vulcanizations, the vulcanizer each time being filled "brim full" of water. This was in the day of fusible safety-plugs, which did not give way to pressure, but only when the temperature rose above the vulcanizing point.

In another case, trouble was experienced with a Hayes

boiler, the discs constantly blowing out. The dentist finally put on three at once, and was rewarded for his trouble by a rupture of the vulcanizer bottom. The cause of all the trouble was found to be, on inquiry, "filling the vulcanizer full of water."

The desire for quickening the vulcanizing process has led to the use of too high a temperature; hence the numerous complaints of brittle plates and spongy rubber.

Superior results can be attained with any good vulcanizer by a low heat, say 300° , the time being lengthened accordingly. The plate may be placed under water or in steam; but to secure any certainty that the thermometer will indicate the true temperature of the interior of the vulcanizer, all air must be expelled from it by blowing off steam when it is first forming. Then the rubber will not be over-heated, and all the work will be evenly done.—GEO. B. SNOW in *Dental Advertiser*.

ARTICLE V.

ON THE TREATMENT OF PYORRHŒA
ALVEOLARIS.

BY J. HENRY WHATFORD, EASTBOURNE.

(Read before Southern Counties' Branch of the British Dental Association.)

The writer refers mainly to a mode of treatment proposed by Dr. Philip Crampton, of Dublin, who was himself a sufferer from pyorrhœa.

He found sulphate of copper act as a complete cure in his own case, and he cured many others similarly affected. For the last two and a half years the writer employed this method of using sulphate of copper in some well marked

cases of pyorrhœa alveolaris (two of them very unpromising) and in the great majority found it curative.

Pyorrhœa alveolaris in its early stage appears to be a form of local inflammation resulting in separation of the margin of the gum from the necks of the teeth, and the formation of a pocket for the lodgment of foreign bodies, the gum at the same time changing its color from the normal pale rose hue to a darker color, becoming spongy in texture, swollen, readily bleeding on slight provocation, and its margin becoming rounder and averted from the necks of the teeth. This may exist for months or years, with so little inconvenience as scarcely, if at all, to attract the attention of the patient. As the disease advances the symptoms increase, and there supervenes a sense of fulness, throbbing, and gnawing irritation. Slight pressure on the gum surrounding the teeth causes a drop or more of thick, sometimes fetid pus to exude at the necks of the teeth. The teeth lose their proper sensibility, gradually become loose, and the denuded fangs become often coated with a tenacious layer of very hard greenish-brown tartar, and if the disease be allowed to progress without treatment, the alveoli get absorbed, and the teeth drop out. This disease is found apparently in every constitution, healthy or otherwise; indeed, the general state of constitution seems not to affect the disease. It appears to be sometimes hereditary; local injury seems an exciting cause in some cases.

The local effects of pyorrhœa resemble those of scurvy, however, the last named disease has very marked constitutional symptoms of what pyorrhœa has none.

Scurvy can be generally traced to constitutional degradation, owing to want of proper nutriment. Again, scurvy is generally readily curable by proper nutriment combined with constitutional treatment and cessation from hardship; local treatment being unneeded; whereas in pyorrhœa local treatment is all-important, and constitutional of slight avail. Some refer the origin of pyorrhœa to the alveolo-dental membrane, others believe that the

alveolar process is first affected, while others attribute it wholly to neglect in cleaning the teeth, and thus allowing tartar to accumulate between the necks of the teeth and the gum. Mr. Charles Tomes has related a case of a patient, aged 25 years, in which all remaining teeth were removed and on many of them distinctly affected there was no tartar. Dr. Arkovy, of Buda-Pesth, found that, besides pus corpuscles, threads of *leptothrix buccalis* were always present in abundance, and concluded the fungus was intimately connected with the origin of pyorrhœa alveolaris. Dr. Islai and others have confirmed these results. A case is quoted exemplifying that the purely surgical treatment advocated by Dr. Riggs is not always successful.

Mrs. P., aged 34, no family, somewhat anæmic in appearance, with good family history, and in very good health.

About three years ago she noticed that her upper and lower central incisors were becoming loose, and her dentist prescribed some remedy, which for a time eased her discomfort; the gums, however, became rapidly spongy, the teeth looser, causing considerable discomfort and at times pain. Her gums were scarified; tannin, carbolic acid, acetic acid, and other remedies were tried without avail, and she gave up all idea of further treatment. Coming under Mr. Whatford's care, he decided to try sulphate of copper. At the time of her visit the incisors of the upper and lower jaws, and the bicuspid teeth of the upper jaw were very loose, and the neighboring gum deeply congested, tumid and thickened, and detached from the fangs, which were coated with hard tartar, more particularly those of the lower teeth, and on pressure a thick discharge appeared between the teeth and the gums. For the first two or three days a little finely-powdered sulphate of copper was packed between the gums and teeth by means of a piece of wood suitably shaped, and an improvement in comfort and in the appearance of the gums appeared on the second day. When the gums had improved in color, and the sponginess

had disappeared, he removed the tartar, which could not be done earlier without causing pain. For seven successive days he packed the finely-powdered sulphate of copper under the gum and around the teeth in the manner described, and then, after a week's interval, renewed the treatment for four more days. The discharge ceased after the seventh visit, but the upper teeth were soonest well; eight daily applications sufficed to cure them; the lower teeth gave more trouble, probably owing to the difficulty experienced in thoroughly applying the remedy on account of the ready flow of saliva it appeared to cause. Eventually, however, all the teeth became quite firm. More than a year since the commencement of treatment the mouth was found to be in perfect health. Two or three applications of sulphate of copper cause such a contraction of spongy gum as to steady the teeth, and make the operation of removing the tartar comparatively easy, and Mr. Whatford removes it at one, or at the outside two visits.

When cases have been of long standing, it is necessary to apply the sulphate of copper at once for eight or ten successive days to ensure immunity from relapse; there is no risk in careful hands in freely using sulphate of copper; it is better even to overdo it a little to make sure of a good result. In early or slight cases fewer applications will suffice. The caustic should be used as a saturated solution, or in powder. Some little pain results from the use of caustic, and this is greatly relieved by holding cold water in the mouth. It is well to prepare the patient for this irritation, which arises at intervals during treatment, lessening gradually, eventually disappearing. The copper taste can be readily removed by a sip or two of bi-carbonate of soda solution, and almost prevented provided the sip be taken while the powder is lying on the gum, and before it becomes mixed up in the mouth by an attempt to expectorate before the sip is taken. In applying sulphate of copper to the gum of teeth in the lower jaw, the saliva ejector may be used; a teaspoonful of a solution of bi-

carbonate of soda is introduced into the mouth as the bulb of the ejector is withdrawn, the patient being told to take a mouthful of water and shake it well about before expectorating.

The properties of sulphate of copper are then considered. It is as a styptic for bleeding surfaces, a stimulant for ulcers, and an escharotic for warts. It is used as a lotion and as an injection to diminish excessive secretions from mucous membranes; ten or fifteen grains in two ounces of water forms a prompt emetic; half an ounce taken into the stomach would probably kill, so that the quantity employed in the treatment of pyorrhœa could hardly produce toxic symptoms, especially if carbonate of soda in solution be employed as is recommended above.

Mr. Whatford prefers sulphate of copper as the remedy to other caustics, because: (1.) Its action apparently involves less loss of tissues, while its curative power seems to equal any. (2.) It does not blacken the teeth as nitrate of silver does, nor act on their structure as acids do, nor spread over more surface than that intended, as chloride of zinc, caustic potash, and some others are liable to do. (3.) Its application, as a rule, causes little pain; its action as a caustic is so limited that the gum freely granulates under its use, and therefore it can, in most cases be applied daily till cure is apparent without checking these granulations as other caustics are liable to do. (4.) Its continued use leads to no detriment, and in most cases a feeling of relief and comfort arises shortly after its application. —*British Journal of Dental Science.*

ARTICLE VI.

BRIDGE-WORK.

DR. L. P. HASKELL'S OPINION OF IT.

(Written for the South Carolina Dental Society.)

While there are occasional cases where this method is advisable, they are the exceptions. I would instance the

case of the loss of a *single* tooth. It would be unfortunate for the patient, as is usually the case, to be compelled to wear a plate just to sustain that tooth; so that a tooth soldered to a bar, the ends of which could be inserted in the adjoining teeth, in gold or even cement fillings, would be perhaps the lesser evil.

But take the case of several teeth attached to two sound teeth, enclosed in gold bands—what results? The cement with which they are finally fastened in place, by constant use of the denture, is loosened and disintegrated, and works out; the secretions flow in, and the tooth is girdled with decay. Next follows the loosening of these teeth by the use of the teeth attached in mastication, so that they are found, in a few years, dangling, ready to fall out. Then there is a certain amount of uncleanness, even in the best adjusted cases; parts that *cannot* be reached to cleanse—and finally, difficulty of repair.

The least objectionable are those cases where they are attached to roots; but here results, in a few years, at most, the loosening of the roots, in consequence of the strain upon them of an entire denture, in the act of mastication, and the patient has been to a heavy extra expense to secure the work (I have known of \$500 being paid,) and now it is worthless, and must resort to the inevitable suction plate, which had better have been made at first, certainly as a matter of economy.

In a vast majority of cases where bridge-work is used, a narrow, nicely-fitting gold plate, secured by *properly-adjusted* clasps, upon the same teeth which had been permanently enclosed for bridge-work, would answer the same purpose, and could be readily removed for cleansing, and no harm done to the natural teeth. I have been in the habit of making such plates for forty years, and can testify from this long experience.

When I speak of *properly* adjusted clasps, I mean a narrow (platinum alloyed gold) clasp, nicely adjusted to the tooth, and arranged with wax upon the plate, *in the*

mouth (never by a plaster cast.) Then invest in the plaster and sand, and solder, attaching *only at one point*, one-eighth of an inch, or but little more, so that the clasp will be springy, and have free play. Then if this is kept clean, it will do no harm to the tooth.

The truth of the matter is, that bridge-work enables the dentist to secure large fees, regardless of the interests of patients—often twice or three times what would be charged for gold plates by the usual process.

The patient, of course, is pleased with the work, never suspecting what is in store in the near future—the loss of valuable teeth, and the final resort to a suction plate.—*Southern Dental Journal.*

Editorial, Etc.

THE UNIVERSITY OF MARYLAND.—The Dental Department of this old and reputable University began its regular session of 1886 87 with the largest dental class that has ever been South of the Delaware river. And for the first time in the history of dental schools in the Southern section of our country a class is present at the University of Maryland Dental Department numbering considerably over one hundred students.

Quite a number of the present class have passed one session at other dental schools--coming to this University for graduation.

Quite a large number of foreign students are members of the present class, Germany being largely represented, also Canada, S. America and Turkey, the latter country sending two students.

Of the United States nearly every one is represented, Penna., New York and South Carolina leading in number. The Medical Department of the University has also an increased number of students, so that affairs about this old institution present a very busy appearance. The practice in the Dental Infirmary has grown so rapidly as to furnish abundant material for practical work in both branches of dentistry to the large class in attendance. From the fact that the number of dental schools throughout this country has increased so rapidly, the extremely large class at the University of Maryland Dental Department is rather surprising, and can only be accounted for by the wide spread reputation which this dental school has acquired throughout the civilized world.

REQUIREMENTS FOR GRADUATION IN BOTH MEDICINE AND DENTISTRY IN ENGLAND AND SCOTLAND.—From the London *Dental Record* we learn the following, the degrees obtained being M. R. C. S. and L. D. S:

"After the preliminary examination has been passed, the student should register as both a dental and medical student; during the mechanical apprenticeship receive instruction from any registered medical practitioner, or from any pharmaceutical chemist, or at a public hospital, or infirmary, or dispensary, in chemistry, including chemical physics, practical chemistry, pharmacy and materia medica, and present himself for examination in these before entering a hospital; or, if he prefers it, he may take the two latter later in his career, viz., at the second examination. At the expiration of his first winter let him pass in elementary anatomy and physiology; at the end of his second winter let him take anatomy and physiology.

At the expiration of two years he may present himself for the dental license; he will during these two years have been attending simultaneously both the general and dental hospital. During the remainder of his time he should devote himself to surgery, medicine, and midwifery, &c., in which subjects he may be examined at the expiration of two years from the time of passing the second examination.

It was felt that the recent changes brought about by the amalgamation of the two Colleges have greatly increased the difficulty of obtaining these higher qualifications; I must ask you to take my word for it that such is not really the case; the curriculum is really simplified, and a candidate now is only re-examined in the subject in which he fails. The old M. R. C. S. only, as a separate diploma, is a thing of the past; it is only advisable to deal with things as they are. I may be asked what is the extra time and money required to take these extra qualifications? It takes two more years, but the whole of these need not be necessarily spent in London. One winter and two summer sessions may be passed in one of the following ways:

- (a) Attending the practice of a hospital, infirmary, or other institution recognized as affording satisfactory opportunities for professional study;
- (b) Receiving instruction as a pupil of a legally qualified practitioner holding such a public appointment, or having such opportunities of imparting a practical knowledge of medicine, surgery, or midwifery, as shall be satisfactory to the two colleges;
- (c) Attending lectures on one or more of the required subjects of professional study at a recognised place of instruction.

The twenty cases of labour can be signed for by any legally qualified practitioner.

The duties of clinical clerk and surgical dresser, which must be discharged after the second examination during six months each, can be performed at a general hospital, infirmary or dispensary, or parochial or union infirmary, recognized for this purpose.

These arrangements make it less costly for students whose parents live in large towns where such public institutions are found, a large proportion of the expenditure being living in town.

The actual increased expenditure in hospital fees is about fifty or sixty guineas. The examination fees for the three examinations for the double qualification under the conjoint scheme is thirty-five guineas.

For the convenience of reference I should like to tabulate as concisely as possible the best mode of procedure for the dental student to obtain the three examinations:—

1. Preliminary examination.
2. Apprenticeship.
3. Register as a dental and medical student, or this latter can be postponed until entry at hospital.
4. During apprenticeship receive instruction as above in chemistry, materia medica, and pharmacy, and pass in them at the College of Surgeons.
5. Enter simultaneously at a dental and general hospital.
6. Pass in elementary anatomy and physiology at end of first winter session.
7. Pass in anatomy and physiology at end of second winter session.
8. Take dental license at end of second year.
9. Devote remainder of time to medicine, surgery, midwifery, &c.
10. Pass, at expiration of two years from second examination, the final test of the two Colleges.

In conclusion, I should like to point out, side by side, the requirements of the curriculum for the dental license and that for the double qualification, thus demonstrating how much of the latter curriculum must of necessity be taken by the dental student, and how few the extra subjects required.

Requirements for Double Qualifications at a General Hospital.

Anatomy—One course of lectures.

Physiology—One course of lectures, three months extra practical physiology.

Dissections—Twelve months.

Surgery—One course of lectures.

Medicine—One course of lectures.

Requirements for Dental license at a General Hospital.

Anatomy—One course and twenty lectures on head and neck.

Physiology—One course of lectures.

Dissections—Nine months.

Surgery—One course of lectures.

Medicine—One course of lectures.

Materia Medica, Chemistry, Materia Medica—One
Practical Chemistry—Done be- course of lectures.
fore entering school now. Chemistry—One course
of lectures.

Practical Chemistry—One
course of lectures.

Practical Surgery and Medi- Practical Surgery and
cine—Three winter and two Clinical Lectures—Two
summer sessions. winter sessions.

Extra Work Required.

Midwifery—One course of lectures, and twenty labour
cases.

Practical systematic instruction in medicine, surgery and
mid-wifery.

Instructions and proficiency in vaccination.

Pathological Anatomy—One course of lectures and
demonstrations in post-mortem room during attendance on
clinical lectures.

Forensic Medicine—One course.

Clinical Lectures on Medicine—Nine months.

Clinical Lecture on Surgery—Nine months.

Clinical Study on Midwifery—Three months.

Clinical Clerk—Six months.

Surgical Dresser—Six months."

Monthly Summary.

A PORCELAIN FILLING.—*By J. L. Stokes, D. D. S.*—
Some time ago there came a lady into my office who was
young and beautiful, but her teeth gave her no little annoy-
ance; some of them were honey-combed on the palatine sur-

face. She called to ask me to fill a depression in the labial surface of a central incisor; it was a very large cavity through the enamel and even into the dentine. I told her that a gold filling large enough to fill the cavity would be very conspicuous, and advised her to let me insert a filling composed principally of porcelain. She consented, and I proceeded as follows: I took an impression of the labial surface of the tooth with modelling compound, and took a cast from that; then I cut in the tooth on the cast, just such an opening as would have to be made in the natural tooth, then I ground up a piece of porcelain from a porcelain tooth exactly the shade of the natural one. In this way I fastened it to a piece of wood with shellac, so that I could hold it, then I cut it to fit loosely in the cavity in the tooth on cast. I allowed a space to remain between the porcelain and the walls of the tooth all around. I then took the patient in hand again, put on the rubber dam, and cut out just such a cavity in natural tooth as I did in the one on the cast; when I had it thoroughly prepared I filled it with very thin cement (Monogram) and put the porcelain in and pressed it firmly to the bottom of the cavity; this drove out the cement to a great extent, leaving only enough in the cavity to hold the porcelain in place and fill up any irregularities that might have been left in preparing the cement or porcelain. Then I waited until the cement was hard. I took a very fine excavator and removed part of the cement from around the porcelain and started the gold filling. I would fill about one-third of the space at the time, leaving the cement intact to prevent the displacement of the porcelain. I had the cavity counter sunk slightly, and the edge of the porcelain was slightly beveled, which caused the entire space between the walls of the cavity and the porcelain to be counter sunk, when I completed the circular filling of gold around the porcelain. I condensed the gold very carefully, and when it had been completed the gold overlapped the edges of the porcelain very slightly, but firmly, and ran back into a groove cut all around in the opening in the natural tooth sufficiently to hold the gold itself in place. When it was polished it looked like a thread of gold, or a very small gold ring let into the tooth.

This operation made the already beautiful and attractive young lady even more so.

Don't it make us happy when we do a beautiful piece of work? and the more difficult it is the happier we are.

I'd give this advice to the younger members of the profession, (the older heads would think me "saucy") always try and improve on every operation you do, and if you have a set of teeth in your charge, in which there is already beautiful work, try and improve on it. This is our duty.—*Southern Dental Journal*.

WIRE LIGATURES.—By Geo. S. Staples, Sherman, Texas.—**DR. CATCHING:** As I promised to let you hear from me occasionally, I will begin with an article on the use of wire ligatures. I had hoped to have demonstrated their use at Nashville, but not having had an opportunity to do so, I give it to the profession through your valuable journal, (provided you think it worth publishing.) I have tried almost all kinds of clamps for the filling of buccal and labial cavities and have never yet found *one* to give satisfaction. So a few months since I had a very difficult cavity on the buccal wall of second left sup. bicuspid. As I anticipated a great deal of trouble with it, I commenced to study some plan by which I could overcome the difficulty, when I concluded to try common binding wire, which I did with the happiest results. Since the first trial I have relegated all clamps for such purposes to the dogs ("or any other power") and now such cavities have no terrors for me any more. In fact, I have not only found wire ligatures the thing for buccal and labial cavities, but on all cavities that extend under the gums, when not so far back as to be unable to apply it.

Now if you think this worth anything you can publish it, otherwise stick it in the waste basket, and there will be no harm done. Any how try the wire yourself and see how you like it.—*Southern Dental Journal*.

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ARTICLE I.

ANÆSTHESIA VERSUS ASPHYXIA.

BY DR. S. J. HAYES, PITTSBURG, PA.

It is to be very much regretted that the vast difference between anæsthesia and asphyxia, has been almost entirely overlooked by writers on anæsthetics and artificial anæsthesia. And yet, not until, we are prepared to concede that anæsthesia is produced by the continuation of the *forces* and *functions* of life under modifications induced by medico-chemical agencies, and that asphyxia is the result of a suspension or abrogation of these forces and functions,—also, that oxygen is the only *life giving principle*, then, and not, until then, can we fully recognize the *essential, fundamental and "bedrock principle"* that there can be no anæsthetic without a proper admixture of atmospheric air with a suitable narcotic, (except it be locally applied,) which must be necessarily and unchangeably true, as the atmosphere is the only element in the physical world that will sustain respiration and life and therefore is *absolutely essential* to an anæsthetic.

Though the gases composing the pure atmosphere, may be breathed in other relative proportions or other gases such as carbonic acid (C. O._2), carbonic oxide, (C. O.), or nitrous oxide, (N. O.), may be taken, for a very limited time, yet they do not support respiration and life and consequently, are not anæsthetics and are never taken without physical injury or positive danger to life. In fact, they antagonize life from the very first inspiration. True, they produce unconsciousness and insensibility, but by asphyxia which is the legitimate result of depriving the blood of the life giving principle,—oxygen—and thus the death of the patient is inevitable when the continuous use of the nitrous oxide or other gas, has so weakened the affinity of the blood for oxygen that it fails to appropriate the oxygen from the air. The failure of these gases to sustain life is not attributable to a lack of oxygen in them, as they contain a greater quantity of oxygen than the atmosphere; but, that the affinity of the oxygen for the other gas, is greater or stronger than the affinity of the blood for the oxygen and consequently, the blood cannot appropriate the oxygen, and therefore, the gas fails to support life.

And yet, a very common error, entertained by many, both in the medical and dental professions, is that as nitrous oxide (N. O.) consists simply of the elements of common air, (N. O._4) only in different proportions, that it certainly cannot do harm and that since it has a larger proportion of the life giving principle—oxygen—when inhaled it should only make one live faster, than when he breathes the air. But this shows gross ignorance of the laws of chemical affinity. It is blending a chemical combination with mixture and drawing conclusions accordingly; certainly a most absurd and fatal mistake.

As pure oxygen would be too stimulating for respiration, we find it in the atmosphere diluted with nitrogen, an inert gas, simply in a state of mixture, the nature of neither being essentially changed. In like manner oxygen and hydrogen when merely mixed retain their gaseous forms

and elemental properties, and while simply in a state of mixture are exceedingly inflammable and explosive, but when these two gases are chemically combined the result of that chemical union is water, which is entirely antagonistic in its properties to either of its elements. Therefore, we recognize, in this, the universal law of chemistry that whenever two elements are united by chemical affinity, the properties of both are changed and the result is a third substance differing from either; and that the elements in such union cannot act in their individual capacity till a positive decomposition is effected. Therefore, it is perfectly absurd to suppose that the blood is appropriating oxygen for the simple reason that we are inhaling something of which oxygen is a chemical constituent. Take for further illustration these two gases,—nitrogen and oxygen—in their five different proportions, chemically combined,—nitrous oxide, (N. O.), nitric oxide, (N. O.₂), hypoxynitrous acid, (N. O.₃), nitrous acid, (N. O.₄), nitric acid, (N. O.₅). Now bearing in mind distinctly the nature and properties of these elemental substances, or when they are only mixed as in the atmosphere and note the wonderful changes wrought by these chemical combinations.

While one proportion of nitrogen and one of oxygen form the exhilarating protoxide of nitrogen or laughing gas, two proportions of oxygen and one of nitrogen constitute nitric oxide gas, one inspiration of which would destroy life almost instantly; five proportions of oxygen to one of nitrogen form nitric acid, (aqua fortis) which cannot be tolerated a single moment by any part of the human system. Now, if it were true that the more oxygen we combine with nitrogen, the more exhilarating and healthful is the result, then, according to this logic, nitric oxide should be twice as exhilarating and healthful as nitrous oxide or laughing gas and nitric acid (aqua fortis) five times. Therefore, the logic is irresistible and the conclusion inevitable as we have demonstrated, that oxygen to be available for the support of respiration and life, must be

free as in the atmosphere, and that any quantity of oxygen in chemical union with other elementary substances can avail nothing in the support of life; and that the pure atmospheric air is the only element on God's earth that will support respiration and life, and hence, is absolutely essential to an anæsthetic. And since any other elements administered instead of the pure air, always endanger health and life, the use of nitrous oxide or laughing gas, carbonic oxide and other gases for the pretended purpose of producing anæsthesia should be prohibited by law.

That pure atmospheric air is nature's only element for respiration to sustain animal or vegetable life, has been repeatedly demonstrated. When nitrous oxide gas is inhaled, it enters the blood as nitrous oxide and is eliminated as nitrous oxide. As Dr. L. Trumbull, in his *Manual of Anæsthetic Agents*, says: "Latterly it has been disproved both by experiment and observation, i. e., the theory which for a time prevailed in the United States that nitrous oxide acts upon the blood as an oxygenating agent, no experimental proof has yet been furnished that nitrous oxide is decomposed in the blood or forms chemical combinations with it. It enters into the blood as nitrous oxide and as such is eliminated."

As early as 1863, Dr. C. W. Foster, a dentist of high repute in Massachusetts, made a severe onslaught on the "high priests of this Modock" in the following language, "When I say nitrous oxide is not an anæsthetic, *per se*, I mean strictly so. Nitrous oxide may be given pure and with the greatest caution, but that does not affect the statement just made; the principle is the same." And then he adds, "That nitrous oxide supports combustion in the body is seen in the remarkable exhilaration of oxidation at exhibitions, etc. That it cannot support respiration or life but a few moments is seen in that frightful gasping of the patient, growing deeper and faster as he dies for want of air. These are the symptoms that precede the stupor and insensibility of this wondrous anæsthetic."

Drs. Joylet and Blanch, in the Archives de Physiologie of July, 1879, give as the result of their extensive experiments that "The protoxide of nitrogen, chemically pure, is not able to sustain respiration in animals any more than in plants, the combustion (in which respiration consists) not being sufficiently energetic to decompose the nitrous oxide gas.

"Breathed pure by animals the protoxide of nitrogen is an asphyxiating gas which produces death with all the usual signs of asphyxia by strangulation or by respiration of the inert gases (nitrogen and hydrogen) and in almost the same time. Breathed pure, if the nitrous oxide produces anæsthesia it is by privation of oxygen from the blood, insensibility showing itself when the arterial blood commences to have only two or three per cent. of oxygen. The arterial blood is then very black and contains thirty or forty per cent. protoxide of nitrogen. Animals are able by breathing an atmosphere of protoxide of nitrogen and oxygen in the proportion of the gases in the air to live, the nitrous oxide replacing the nitrogen without producing troubles of insensibility.

"The arterial blood then contains thirty to thirty five per cent. of protoxide of nitrogen. Birds plunged in a similar confined atmosphere, behave like those placed under a bell-jar of the same capacity containing air, and die after having nearly equally, consumed the oxygen in the receiver and formed as much carbonic acid. The protoxide of nitrogen being an irrespirable gas, and possessing none of the anæsthetic properties that have been attributed to it, its employment can only be dangerous and should be under that title prescribed from medical practice."

Dr. H. Lyman in his extensive and thorough work on "Artificial Anæsthesia and Anæsthetics," page 318, says: "Nitrous oxide does not enter into any chemical combination with the elements of the body, but is simply dissolved in the blood, hence its speedy entrance and departure from the organism. Again, nitrous oxide is not decomposed in

the blood, consequently it cannot replace oxygen or yield oxygen for the respiration of the tissues."

A committee appointed by the British Medical Association reported to the same effect in the *British Medical Journal* of January, 1879, to which we invite the reader's attention.

Many other eminent authorities might be quoted to the effect that nitrous oxide is as much of an asphyxiating agent as are the inert gases, nitrogen and hydrogen, and that it will produce asphyxia and death in about the same time; but we will conclude with the following "experiments with nitrous oxide and carbonic acid," as reported in the *Odontographic Journal*, Vol. 2, No. 4, January, 1882: "At a union meeting of two of the District Societies of Western New York, held at Buffalo, the latter part of October last, Dr. W. C. Barrett, assisted by Dr. A. P. Southwick, performed a number of experiments on small animals, using for that purpose nitrous oxide and carbonic acid. The apparatus consisted of a cylinder, a larger one of carbonic acid, and a covered glass receiver, twelve to fifteen inches in depth. Near the edge of the cover was a small opening through which, by means of rubber tubing, the gases were conveyed to the confined animals, and through which also their exhalations were permitted to escape into the room. The method followed in each experiment, was to place the animal in the receiver, adjust the cover, pass the tubing through the opening above mentioned, and then turn on the gas, the time being taken at the moment of admission of the gas, and again when life was pronounced extinct.

"The following table gives the kind of animal experimented on, the gas used, the result of the experiment, and the time consumed:

1.	Pigeon, (common)	carbonic acid,	death,	1 min. 20 sec.
2.	"	" nitrous oxide,	"	1 " 20 "
3.	" (tumbler)	carbonic acid,	"	1 " 10 to 25 " *
4.	"	" nitrous oxide,	"	1 " 30 "
5.	Rabbit,	carbolic acid, †	"	1 " 25 "
6.	"	nitrous oxide,	"	1 " 40 "
7.	Mouse,	carbonic acid,	"	1 " 10 "

Artificial respiration was resorted to in all cases except "7", but without effect except in "5".

Thus having proven both from the very *best* of authority and the logic of facts, in demonstration of the laws of chemical affinity, that oxygen,—the life giving principle,—chemically united with any other elemental substance, cannot support life, that when taken in its pure state, it is too active and stimulating for respiration and that, when simply mixed with nitrogen as in the atmosphere, it will support respiration and life, we have *unequivocally established* the fundamental or *bedrock* principle, that there can be no anæsthetic without a proper admixture of atmospheric air with a suitable narcotic.

The definition sometimes given, that "anæsthesia is the absence of sensation," is not sufficiently explicit; nor yet is it true. For in death there is an absence of sensation and one who is dead cannot be said to be anæsthetized, for there is an absence of life as well as of sensation.

Again, there is also, in that state or condition called syncope, an absence of sensation but there is also an absence of the forces and functions of life brought about by an interruption of circulation. Nor, yet, can this condition be in any sense called anæsthesia any more than asphyxia or death can be thus named. As we have already demonstrated, insensibility and unconsciousness are the result of asphyxia as well as of anæsthesia. But that peculiar condition of the system, so much desired for surgical operations, is an absence of pain with the continuation of the forces and functions of life, and that we properly name anæsthesia. Hence, no scientist should be so stupid as to confound anæsthesia with asphyxia, or as to make little or no distinction between them.

Anæsthesia is a perfectly safe condition for surgery. But asphyxia, syncope or coma are *positively dangerous* to

* Disagreement on the part of time keepers.

† Pronounced dead in the time given, but subsequently restored to normal condition by means of artificial respiration.

life. In fact, that which is breathed in lieu of the atmosphere, that produces asphyxia, antagonizes life from the first inspiration; while asphyxia itself is a very near approach to death, just so near that when the patient has continued in that condition long enough that the affinity of the blood for oxygen has so weakened that it fails to take up the oxygen from the atmosphere, the patient is irrevocably gone.

While it is true that narcotics may be administered in such a manner and in such large percentage as to induce a suspension of the vital forces, and thus produce asphyxia or syncope, yet it is more than equally true that none of these dangerous results follow when a proper admixture of pure air with a suitable narcotic,—diluted and attenuated in such a manner and in such a percentage as to meet the wants and condition of every patient in the various stages of anæsthesia,—is administered by a competent person with suitable apparatus.

ARTICLE II.

SOUTHERN DENTAL ASSOCIATION.

EIGHTEENTH ANNUAL MEETING.

AT NASHVILLE, TENN., JULY 27, 28, 29 AND 30.

(Reported by Mrs. M. W. J.)

[Continued from October Number.]

Prof. Taft was called for, and greeted with applause.

He said that he had no extended remarks to make, though all were interested, and all had an opinion on this subject; a man was no longer excusable who had not some opinion, though of course they varied widely. As to the

pathology—but first of all nomenclature; names are adopted and become fashionable or customary, which are not appropriate.

There are different manifestations in different cases of this disease. The name Riggs' disease is not appropriate; he had no idea of pre-empting it; he made no special claims to discoveries; his system was only an extension of what had already been done. The name Pyorrhœa Alveolaris is stilted, and has no special meaning beyond that of a flow of pus from the alveolus; the old term "conjoined suppuration of gums and alveolus" is perhaps better. It is not a specific disease; it has many phases—the peculiar separation of the gums from the teeth; the flow of pus; the formation of pockets; the channel, down the roots of the teeth, sometimes penetrating very deeply, and sometimes only superficial, and sometimes extending down to the apex. A good deal has been said as to the disease being local or constitutional. There is undoubtedly a systemic condition which favors its occurrence and continuance, but yet it is undecided what that condition is. Whoever says *always* should study this up. There may be a poison in the system which favors this disease under local stimulus, though not without local irritants. "Conjoined suppurations of the gums and alveolus" does not exist solely and alone from systemic conditions, independent of local causes; the two act together. Some agents expend their great force on the periosteum as mercury in pyalism, without local irritant beyond vitiated saliva. Riggs said there was *always* a local irritant. There was wonderful success in his treatment, which rarely ever failed, though he seldom employed systemic treatment. Usually, in all cases there is more or less of local irritation; it may be vitiated debris of food or epithelial scales, or salivary calculus or serumal calculus, or the margin of the alveolus may be diseased in some form disintegrating as in necrosis of the margin. Then microbes, here as elsewhere, play an active part; what the results are of the presence of these organisms is not yet

clearly defined; some believe they prey on the living tissue and break it down; others that their fermenting products work the mischief. There is room here for study and investigation; nobody has yet brought out a tangible point on which we can rest satisfied. I do not believe they are always there, but though they are present in many cases, in some of the most severe cases, no vestiges of organisms are found in the debris. The use of a germicide is, however, entirely admissable, and should be resorted to. When we know what we are dealing with, we know what is needed—(Time up.) (Go on, go on.) Different phases or stages of the affection require different modes of treatment, and it is important to differentiate. Some features are common to all cases. The removal of all irritants has been spoken of. The first essential is the local purification of the mouth and teeth, which must then be kept in a clean condition; all calcareous deposits must be removed, the pockets being probed deeply with explorers; all sloughing and decayed portions of gum tissue, and all necrosed portions of the alveolus must be removed with appropriate instruments. A large share of the instruments sold for this purpose are entirely unfit; they should be made slender, and should chisel downwards, removing every particle of debris; this will not be found difficult with proper instruments, but cannot be done with a great hoe or by digging down. All necrosed, roughened portions must be removed; with the engine all ragged points can be burred off. The use of sulphuric acid has been referred to; this only acts upon tissues that are in a dying condition; healthy tissue is safe. Granulation cannot attach where there is the least deposit. We hear of mixing this, that, and the other, but you must know what you are aiming at, and why you should use this remedy rather than that, and not combine two, one of which will undo the work of the other. When a mechanic selects a tool he knows what he wants it to do, and selects the one adapted to do that one thing. There is too much ignorant use of therapeutic agents; very little

medication is needed in any case. Riggs used no medicine at all, in many cases; sometimes a little tannin or carbolic acid, but he did not use heroic treatment. Iodine in creosote Atkinson called his *big nigger*; he now uses a mild solution of salycilic acid. As a rule we should rely more on surgical than on therapeutic treatment; study causes and systemic peculiarities, but rely on the thorough removal of debris. We have sloughing, half-dead tissue, instead of healthy socket; even the surface of the gums require scraping off, the exudations being a continual irritant. Peroxide of hydrogen is the *grand* agent, though I don't say "don't use anything but that." It prevents decomposition of debris; it is a gerimicide for organisms which are destroyed and thrown out. There will be *healing* after thorough surgical treatment, though I don't say there will be restoration of tissues or process. If the teeth are loose the gums cannot be healthy; pabulum is thrown out, but the granulation is continually broken up and disturbed; the teeth must be bound with fine suture wire and made firm and secure; this alone will soon relieve irritation. In a word, remove *all* irritants, and dress with a little peroxide of hydrogen, or salycilic acid in alcohol.

Dr. Thackston said that with hearty sincerity he wished to thank his friend Taft for his able address. There is one point to make; when in the domain of speculative theory it is easy to map out forces, causes and results, but in the domain of facts, what we have most carefully thought out sometimes fails us. Our friend, in his clear and happy manner, placed great stress on the removal of local irritants; but where do these irritants, this local debris, come from? We have all seen conjoined suppuration of the gums and alveolar process occur where we know the most scrupulous care has been taken of the mouth and teeth. I have seen a professional brother whose reputation is well established for great manipulative skill, employ in vain every resource for the arrest of this disease; there is an acid, dissolving exudation, which we cannot arrest, and

before which all goes; the gums and alveolus melt away and the teeth are lost. Salivary calculus has its source of origin in the secretions of the mouth, and that can be kept off, but there is another source of deposits which we have not reached. Uric acid is a happy suggestion which I am glad to hear made. Teeth which are perfectly free from caries loosen and drop out, having resisted all remedial agents. The neck and sides of the root may be clean, but the very apex be found enveloped in a reddish brown deposit of a tartarous variety; not from the saliva, not from the gums—but from the blood itself; we can't get at it, and the tooth is lost.

Dr. Winkler: Do you infer that the deposit at the apex takes place previous to the loosening of the gums? that it begins at the apex?

Dr. Thackston: I do, sir; there are two sources of calculus; this form is not a salivary calculus; the mouth is not the only place where calculi are deposited; we find them in the liver and elsewhere. The reddish brown incrustation at the apex of the roots is not from the gums, it is from the blood; and is systemic, and would eventually cause the loss of all the teeth.

Dr. Teague: Would it not be possible to reach this deposit at the apex with instruments? Could they not be run down to the deposits?

Dr. Thackston: No, sir; teeth may have this deposit at the apex, which are firm in the socket, and the gums well attached at the necks.

Dr. W. C. Wardlaw, (calling Dr. Catching to the chair): I have seen cases with this dark, sanguinary deposit on the roots. I gave one to Dr. Frank Abbott to examine with the microscope; he had several specimens. This occurs without any detachment of the gums.

Dr. Taft: One word in explanation. There are extreme cases, I have seen cases similar, but never in the absence of alveolar abscess. The gums may be firmly attached at the neck, and serual calculus be found upon the root, but

not in one single instance have I found it, unless there had been alveolar abscess. The exception must be very rare, and we need to deal with every day cases, not with the exceptions. There are some cases which cannot be explained, but they are rare.

Dr. Rembert, (Natchez,): Is not serumal calculus thrown out from degenerated plasm, or pus flow, as salivary calculus is precipitated from saliva? Serumal calculus is not from the blood, but from serum a product of decomposition exuding from the blood through the tissue, and from the blood only in that sense; a product or deposit from decomposing serum.

Dr. J. J. R. Patrick said that chemical analysis had never shown any difference between sanguinary and salivary calculus; it is only the mode of deposit, or of throwing out, that is different. That from the saliva is secreted and thrown out; the blood vessels are unhealthy and the capillaries ruptured in throwing out serum. Salivary calculus is a secretion; sanguinary calculus is a concretion.

The time for adjournment having arrived, Dr. Catching suggested that a night session be held, as there were other papers to be read.

Dr. Salomon said that arrangements had been made for Dr. J. R. Knapp's night clinics with electric light and apparatus.

Dr. J. Hall Moore understood that it had been agreed to by the committee of Arrangements, that the members visit the museum of the Tennessee Historical Society at 8 P. M.

After some discussion it was decided to have a night session.

Adjourned to 8 P. M.

THURSDAY, July 29.

Called to order at 8 P. M., Dr. B. H. Catching in the chair.

Dr. W. R. Bourne, Hopkinsville, Ky., was elected to membership.

The discussion of Pathology and Therapeutics continued:

Dr. Morgan said that the fundamental principle in the treatment of disease is the removal of the cause. Every step taken should be based on the idea of its pathology differentiated in the mind of the practitioner. The only radical cure for this disease (*Pyorrhœa Alveolaris*) is the removal of the teeth. He had never known it to fail; and this suggests the question whether the cause does not lie in the teeth themselves; whether the primary cause is located in the tooth or its environments? Some writers say the tooth is composed of enamel, dentine and cementum; others include the pulps; others again include the investing membrane of the tooth. The trouble seems to be located either in the cementum or in the pericementum, or perhaps back of that, as it is hereditary to a large extent. One reason why it is probably located in the cementum, is that if the cementum is thoroughly scraped off, and thus devitalized by separation from the periosteum, passing low down on the roots of the teeth till the point of juncture is reached, the trouble is removed, and the gums heal up around the tooth. All irritating substances tend to produce absorption. Nature takes that method of relieving herself of trouble from pressure. Whatever may be the etiology pathologically we have:

First—irritation,

Then—inflammation,

Then—solution of parts.

The incrustations are not always calcareous; soft, pasty matter, causes breaking up of tissues, followed by a darkish tartar, the result of decomposition of the tissues of the blood. Lime salts are carried in the blood, and in this breaking up, the lime salts, which have to be disposed of, crystalize about the neck of the tooth, crystalizing under the laws of chemistry.

Almost every one who has spoken mentioned removing necrosed alveolar process. In treating the disease for

nearly forty years, I have not seen exceeding six cases where there was any necrosed bone. There is softening of the bone, loose lime salts are carried off by the emunctories—perhaps used in building up other portions of the body, though we don't know that. We find softened alveolar process, but not necrosis. The process is all absorbed, which is a physiological action. Necrosis is pathological, and cannot undergo a physiological process. Physiological processes relate to living tissues; dead tissues are not absorbed. In this disease the alveolus is dissolved—brought into solution and carried off in the general circulation. In a case recently seen, a man of bilious temperament, sinewy, tough and elastic, the left inferior lateral incisor was loose in its socket; removing all debris the exposed edges of the alveolus were reached and found to be necrosed, and only this one tooth so affected.

One of the grand mistakes in the treatment of this disease occurs in the too frequent surgical operations. A tooth gives evidence of pyorrhœa; there are foreign substances around the root. These are removed as clean as possible, medicaments applied, and the patient told to come again to-morrow for a renewal of the process. If the work has been thoroughly done at the first sitting, the soft tissues are broken up, and blood is poured out; a fibrous coagulum is formed which should be retained there; it furnishes protoplasm, and should not be disturbed. It is similar to what takes place when a tooth is extracted; blood is coagulated, the color is washed out, the coagulum grows tough and a fibrous tissue is produced. About the third day the socket will be found free from blood and filled with organized lymph traversed with little blood vessels, which soon becomes perfectly organized soft tissues. In the same way, if the pockets are left alone, say for ten days, nature will fill them up; gentle friction upon the gums is advisable. If here and there we find some trouble, it is proof that the debris was not thoroughly removed—but only those points should be touched a second time. The question was

asked. Is the periosteum ever produced? is the cementum ever re-produced? *Never, NEVER.* Nature does not do that. The tissue that is formed is not normal tissue; it is largely of the nature of scar tissue; it is of lower vitality takes on inflammation more slowly, and breaks down more slowly. Nature builds up a scar tissue, analogous to cartilage, which holds the tooth firmly in place. The cavity made by an abscess is filled up by comparatively healthy tissue; but it is never perfect; there is always a little chronic inflammation at the end of the root—conditions which normal tissue would not tolerate. If fungus cells are found in the walls of the pockets, nothing equals carbolic acid for destroying them by escharotic action, also stimulating healthy granulation. Robinson's remedy, carbolic acid and caustic potash, is also very effective. When two or three teeth have been thoroughly cleaned of debris, by Riggs' method, a roll of cotton or fibres of candlewick, is dipped in the solution and laid on paper to drain. It is then placed around the necks of the teeth, and left there while two or three more teeth are cleaned. When ready to apply the remedy to these, remove the cotton from the first. It gives a charred appearance, destroys all fungus growth and pus. These teeth should not be touched any more, except brushing with a very soft brush. If not healthy after this treatment, it is because they were not thoroughly cleaned. But in any case, wait eight or ten days before renewing the application. The disease seems to be local, but it is the local expression of systemic disease. Whole families, parents and children alike, are affected by it. If in the case of young children, it is taken in hand promptly, say by eight years of age, it may sometimes be arrested forever, with strict cleanliness and friction of gums. It is much more prevalent than might be supposed, though not perhaps as much here as has been described in Georgia. The constitution is undermined and destroyed by it. Physicians don't understand it. The vital forces are reduced, and patients succumb readily to other diseases, through

lowered vitality. In a recent case, an old man of seventy was supposed to be dying of hereditary consumption. He was thin and bloodless, and scarcely able to walk across the yard. He had nearly all his teeth which were badly affected by pyorrhœa. Within three months after their extraction, his cough and expectoration were much lessened, his night fevers left him, and he gained ten pounds in flesh. In another case a lady gained forty pounds in weight after the teeth were removed. Nothing was done for a cure beyond taking out the teeth. The disease is akin to scurvy, and diet must be carefully looked to. Feed on the fat of the land, so that it is digestible.

Dr. J. Hall Moore asked if the cases cited could not have been treated and cured without the removal of the teeth?

Dr. Morgan replied that there was always a predisposition to return; the hereditary tendency cannot be removed; it is the local manifestation of constitutional disease.

Dr. Rembert, Natchez, asked if the calcareous deposits in young subjects, were equal in proportion to older subjects?

Dr. Morgan replied that it differed both in quality and quantity. The deposits in young patients are not dense or calcific; they are of a granulated, cheesy consistence—only semi-solid. Cotton loaded with carbolic acid, or iodine or other mild escharotic, laid under the loose gums, and left there till expelled by nature, will often check the ichorous discharge and relieve it entirely. Tonic treatment is also needed, but any systemic treatment with a view to the general health, should be turned over to the general physician. It is not the province of the dentist to treat disease.

Dr. Rembert thought that even heredity might be overcome.

Dr. Morgan: Only feeble conditions and forms of disease were overcome—not the hereditary tendency to recurrence.

Dr. J. Hall Moore wished to call attention to a point overlooked by previous speakers. He had not seen a single case which had made much progress, that was not complicated with catarrh, and in that case, constitutional disease could not be cured by mere local treatment. In many cases there were no deposits on the teeth; the roots were perfectly clean, bright and polished, but all other symptoms—exuding pus, pockets reaching down to the apex, roughened alveolar border, etc., but neither salivary nor sanguinary tartar, and always complicated with catarrh.

He knew of one case which had been published in every journal in the country as evidence of the success of Dr. Riggs' method of treatment, (in the hands of Dr. Mills) but the patient eventually lost every tooth, as clean as a pitcher, and perfectly sound; with the exception of three or four small cavities the teeth were sound and hard. This patient had catarrh fearfully. Such cases cannot be cured by local treatment, which is at best, only palliative. Dr. Moore requested the members of the Association to note the association of catarrh and pyorrhœa in their practice. He was apprehensive that there was no radical cure for the disease; that it would always break out again, unless catarrh was first cured, the latter being the cause of the trouble. He had submitted the idea to Dr. Riggs who had agreed with him.

Dr. Rembert asked whether it were not a mooted question that catarrh is constitutional?

Dr. Moore said it was not, in his mind at least.

Dr. Morgan said that Pyorrhœa Alveolaris obtains much more largely in the scrofulous diathesis, whether in the blood or in the lungs, and was also more frequent in blondes. He would not attempt the cure of such cases until a physician had given constitutional treatment.

On motion of Dr. Beech the subject was passed.

Dr. Beech stated that Dr. Knapp was now ready for his clinics with the electric lamps, and moved that the Association adjourn, to witness the clinics.

The President stated that there would be time for the reading of a short paper, while Dr. Knapp was arranging his battery, etc.

Dr. B. L. Byrnes, Memphis, said that in reading the DENTAL JOURNAL, he had always found the chapters of Office Incidents very interesting. He had accordingly made that the subject of his paper, which was then read.

9:30 P. M.—The clinic of Dr. J. Rollo Knapp was quite largely attended, considering the hour. The electric appliances consisted of a number of lamps varying in power from 27 candle to $\frac{1}{4}$ candle. The larger sizes from three candle up were designed for use out of the mouth. By an ingenious invention the lamps were held upon the forehead, and the light for night work directed with great precision, the lamps being ignited or extinguished instantly by means of a thumb screw situated near the right ear. Each lamp was provided with a reflector, which entirely screened the eyes of the operator, at the same time throwing the rays of light directly where they were most needed. The smaller lamps were so constructed as to permit of use in the mouth, a lamp being attached either to the tooth to be operated upon, or to a contiguous tooth, as convenience may suggest. The light may be used in the mouth for an indefinite length of time without heating or burning the mouth. There were also other electric appliances of original and varied character, which called forth the highest encomiums from all who saw them.

Adjourned to 9 A. M.

FRIDAY, July 30.

FOURTH DAY—MORNING SESSION.

Called to order at 9 A. M., the President in the chair. Dr. O. Salomon, acting Secretary.

Owing to the absence of the Recording Secretary, roll-call and the reading of the minutes were dispensed with.

Dr. W. H. Morgan stated that he had something of a report to make, the items of which were in the hands of

Dr. G. F. S. Wright, of the Executive Committee, who was not present.

If there was no other business before the Association, he would make a verbal report of a matter, which though his business, was not his pleasure.

Charges had been preferred of unprofessional and ungentlemanly conduct on the part of one of the members of the Association, in the form of Resolutions of Impeachment. It was the right and duty of the President to appoint a committee to investigate these charges; and report at the next annual meeting.

The President: The gentlemen have heard the remarks of Dr. Morgan. If there is no objection I will appoint as the committee of investigation:

Drs. W. W. H. Thackston, J. Hall Moore, G. H. Winkler.

Resolutions of thanks were then offered to the Y. M. C. A., Vanderbilt University; the Tennessee Historical Society; the Nashville Art Association, and to Mr. Carroll, in charge of the latter, for his kind attentions to the Association. Carried by unanimous rising vote.

Drs. Salomon, Morgan and Crenshaw, the committee appointed to draft resolutions on the deaths of Drs. Holmes, Best, Jobson and Redman, reported as follows:

(No report was furnished.)

The discussion of Pathology and Therapeutics continued:

Dr. ——— said that though not a member of the profession, he had been an interested listener, and had never enjoyed a meeting more. He thought it would be of great benefit to members of the medical profession to attend these meetings. The discussion of diseases of the gums and alveolus had been very valuable. His own experience in that respect had been somewhat peculiar. Having had his teeth examined sometime before, they had been found in perfect order with the exception of a little calculus, and stains from the use of tobacco. He then concluded to

abandon the use of tobacco, but in a very short time his teeth got loose, with pus exuding from the gums, etc. He resumed the use of tobacco, and his teeth got perfectly firm again and the gums sound and healthy. He wished to know what connection, if any, there was between the use and disuse of tobacco, and the condition of his teeth? He had had no treatment of any kind.

No further remarks were made, and on motion the subject was passed.

CHEMISTRY.

Dr. Theo. Johnstone, South Carolina, read a paper entitled

GOLD—COHESIVE AND NON-COHESIVE.

There being no other papers, the subject was declared open for discussion.

The Executive Committee recommended for membership Dr. R. Paul Jones, ————, who was duly elected.

Dr. Morgan said South Carolina ought to cultivate the author of such a paper, and he congratulated the Association on having a young member capable of producing it. He must, however, differ with him in some points. It is not generally received that gold is the most ductile of metals, but that is immaterial. The next misstatement is that gold must be chemically pure in order to weld perfectly. Gold with 6 per cent. silver alloy is very cohesive, as for instance, that made by Abbey Bros. The color indicates the presence of silver. But the purer it is the more cohesive it is. We want it pure, and he hopes we will get it pure. The writer of the paper assumed that latent heat was driven off by the hammer. The heat is produced by the hammering; it is the result of friction, but heat is not actually driven off. There is as much heat present in solid gold as when the particles are loose, but it is not manifest. When a bar of solid gold is hammered out, heat is developed as the result of friction among the molecules.

Dr. Marshall, Little Rock, asked what per centage of

platinum gold would receive without impairing its cohesive properties.

Dr. Morgan replied that he had not experimented in that direction. Had never used it when welding was necessary; only for artificial dentines. One pennyweight to the oz. would stiffen it and make it harder; two pennyweights to the oz. gave a spring temper equal to steel if not annealed.

Dr. Johnstone said that there was a great deal of speculation about heat; we can't see it; we can only see its effects. In all matter the pores are occupied by heat. If a sponge is dipped in water the pores are at once filled with water, which can readily be squeezed from it. In the same way heat occupies the pores of gold, causing its expansion, when hammered the heat is driven out, as when the sponge is squeezed. In iron this can be more readily seen, the metal turning red under the hammer.

Dr. Salomon: In reply to the question put by Dr. Marshall—stated that the addition of platinum to gold in the proportions of three, six or even ten per cent. did not destroy the welding properties. Ten per cent. makes it very hard, but three or six per cent. is easily worked, and very cohesive.

Dr. Winkler said that platinum and gold cylinders, where the platinum is beaten out and covered with gold which is sweated to it, are very cohesive, and easily welded. They are used where gold alone would not resist the wear. No. 3 cylinders are liable to break instruments, but the work has a beautiful appearance, making front fillings which are scarcely perceptible to the eye, though the third of a tooth is built down with it.

Dr. Morgan said the heat evolved was simply in obedience to the law of equilibrium; but the heat was not an entity as held by the old philosophy; it does not occupy space, it is only a mode of motion, it is eliminated or produced by the motion of the molecules. If gold and platinum are melted together, the molecules lose their

cohesion, and the molecules of one metal being smaller than those of the other, they run in and pass between each other. If molten gold is stirred with a platinum wire, the platinum wastes away; its molecules floats off and pass between the molecules of gold.

On motion CHEMISTRY was passed, and

OPERATIVE DENTISTRY, which had been temporarily passed, was called up again, at the request of Dr. Crenshaw, who said that he had had no opportunity of answering the remarks made on the discussion of his paper. He said that though, as Dr. McKellops claimed, some men had abandoned the electric mallet, it was not true of the most prominent men. The electric mallet is a complicated affair, the battery must always be exactly right; the use of the mallet and the care of its different parts is hard to understand; too much for ordinary men, and few are willing to undertake the care and annoyance necessary to keep it always in order. He has had tussles with it himself, with both the mallet and the battery, but when kept in proper order, and the gold all right, it is the finest device ever invented. The fault does not lie in the mallet, but in the operator, who has not the ability to keep it in order. He had brought his own mallet,, superbly adjusted, for a clinic, but having a new battery it wouldn't go. To be always ready, it is necessary to have two, one at the manufacturers, and one to use, alternately. A new mallet costs \$35.00, but he had bought one for \$10.00, and with \$17.00 out for repairs it was as good as new. The blow of the electric mallet is philosophically correct; the blow of the mechanical mallet is not correct; you can drive a tack down with it. You can with the pneumatic mallet, and you can with the electric mallet, with proper sweep. Again, Dr. McKellops said that he had seen the whole socket removed by separators. He probably meant some of the bone, for I don't see how the socket could be removed,* though

* The word used by Dr. McKellops was *ruined*, not *removed*—Reporter.

I have seen the suture opened by separating teeth in children. We must use judgement and sense, or we may do harm. A patient for whom I made separations yesterday was well pleased, and found it less painful than rubber wedges. Dr. Winkler said that soft gold was more acceptable to cervical margins. I have run the gauntlet of all the different methods, hand and automatic pressure, matrices, soft gold, hard gold, and both combined, but don't like the idea of changing from one material to another in the same cavity; you don't get proper welding of the two. Why use soft foil? You admit that by weight you can put in more cohesive gold than soft; this indicates that a filling of cohesive gold is more dense. Why does Dr. Winkler put soft foil at the margins? It is done because it is so difficult to get at the margins with cohesive gold. But if the tooth is cut down, and access obtained, and the dam applied, cohesive gold will give better results. I respect those men but I antagonize their views.

Dr. Morgan: You say we all know what the blue appearance around the filling means. We *don't* always know.

Dr. Crenshaw: It always means a recurrence of decay.

Dr. Morgan: Exactly; *if* it has not been properly filled.

Dr. Crenshaw: If the filling is made with chunks and pellets of foil, and not properly condensed, of course the work is faulty. I do not hope to make converts, or to convince any one, but merely to lay before you what I *believe*; not to present *new* principles, but the principles which have been adopted by such men as Atkinson, Marshall Webb and Parmly Brown. I hoped to elicit a discussion, but I did not expect to convince any one. I know I haven't done it, but I don't care a bit.

Dr.—Beech thought it was a narrow view to hold that every cavity, under every condition, should always be filled in the same way. He thought that there were many

teeth that could not be filled with cohesive gold, that might be saved with something else.

Dr. Crenshaw: If an angle has to be turned, it cannot be done with soft gold; the filling cannot be made to stand without a wall. Everything that can be done with anything else can be done as well, if not better, with cohesive gold and the electric mallet, and much more that cannot be done with soft foil—Dr. Webb never used soft foil; Dr. Brown never uses soft foil; but it is not because these eminent men don't know how; but some men cannot do it, they don't know how, they never will be able. If it is possible to make a system, it can only be by confining to cohesive gold, to simplify and avoid confusion. Dr. Winkler was looking for a subject for his clinic. A gentleman offered an approximal cavity in a bicuspid, with angle turning and going into the crown; oh, no! he wouldn't take that—he wanted something he could fill with soft foil.

I have used soft foil, myself, with fair results, but I can do much better with cohesive gold and mallet force.

Dr. Winkler: Dr. Crenshaw spoke of chunks and billets, etc. We very often see fillings looking as if the gold had been chunked right in, but some men run after new gods, and are so carried away by the latest novelties that sense cannot be knocked into their heads with either billets or chunks! We use soft foil at the cervical walls, *not* because it is more acceptable, but because with it we are enabled to preserve poor, soft teeth from decay. It is true that the use of cohesive gold requires extreme manipulative skill, and that ordinary operators will have better results in saving teeth, if they use soft gold at the cervical walls. It saves much painful labor to the operator, and much suffering to the patient. It is true that Marshall Webb said that tin foil was the most difficult material to use, but though I revere and respect him as a great man, it must be that he deemed himself not able to use soft foil, or he would not have put in his book that tin foil was the most difficult.

As to my clinic, I was invited to clinic with soft foil. The case mentioned by Dr. Crenshaw was one which, to give the best results, required the combination of both cohesive and soft gold, and I was not there for that purpose. I did not want to use cohesive gold, when I was up for a clinic for soft gold. The operation would have been simple and pretty, filling two-thirds full with soft foil, which could have been completed in three or four minutes, and then built out with cohesive gold, which welds perfectly, as has been proved and demonstrated, by heating small pieces and putting on while hot. The soft foil must be thoroughly condensed, shaping it to conform to the surface of the tooth, preserving the relations of the cavity walls. It is the duty of every gentleman to study up the different methods. Dr. Crenshaw said he had tried everything, but when the inevitable blue line appeared, it showed he did not know how to use soft foil.

Dr. McKellops: As far as the electric mallet is concerned, I have got something to say. The gentleman presumes to say that Perry, Darby, Allen and myself can't take care of a mallet! that we don't know our business! I have had as good a mallet as was ever made, and the best batteries. I have a girl who takes splendid care of everything, and everything I have is always perfectly clean and in perfect order. My objection to the electric mallet is that it is too harsh, too severe; patients can't sit under it. Of course, it is a great nuisance, but I have proper assistants to care for all that. Perry has the very best of everything. I did not say anything about the use of Perry's separators; I said by rapid wedging, but I have seen Perry himself use wedges instead of his own separators. Separating with tape creates very little soreness, but forcing apart with separators and screws is very painful. The socket I spoke of was ruined by driving a stick in.

Don't say I can't take care of my apparatus. I like Bonwill's instruments, but I don't like the man who condemns me because I won't give him a certificate. The

beauty of Bonwill's instrument is that the blow is perfect. You will be converted in a minute, if you try his mallet, but you have got to learn how to use it. I didn't like it myself at first. I changed the springs myself, so as to use it with either hand. The electric mallet delivers 2,000 blows, but Bonwill's will make 3,000 in a minute. I did not abandon the electric mallet because it was a nuisance, though it has to be in Philadelphia all the time unless you have proper assistants. I have recently seen a new one, which is very small and light, but you must have a battery.

I like the platinum foil. I first learned of it from the *Scientific American*, and sent to Black, of California, and got his, which is very heavy. I use it for all work which shows, and which must stand mastication; for powerful jaws which grind off the surface, platinum gold is like steel. You can also match the color of the tooth very exactly. I have recently built down all the front teeth for a very large man, who is very blonde. He shows his teeth very much, but you can't tell that they are filled. The color never changes, and you don't hear children cry out "See the man with the gold teeth!" It is beautiful, durable and makes no display. I went with Marshall Webb to Stamford, to see the Wardwell Bros. fill a tooth for Webb. They introduced platinum gold to Webb in his own mouth! a lower molar on the left side. There were no more particular men in the world than the Wardwells; their work was all done to a nicety; they used the mechanical mallet; why don't they use the electric mallet? Certainly not because they don't understand it!

Marshall Webb himself was not always successful; Parmy Brown tells of many failures; they are but mortal men, and sometimes fail like the balance of us.

Dr. G. S. Staples, Sherman, Texas, said he had come from Texas to take a back seat, and listen and learn. There is a great difference in the manipulation of hard or soft gold. He was satisfied that twenty-four out of twenty-

five operators ought to use soft foil, because it is much more difficult to use cohesive gold; a man who lacks thoroughness has no business to use it. The dentist is born, not made, and you can't make a dentist out of every young man. It will not do for a man who is nervous and impatient to undertake to fill teeth with cohesive gold. It requires more nerve than anything else. To attain success work must be thorough and don't stop till it is finished. The great cause of failure is lack of thoroughness. If you only expect to get twenty-five cents for it, do it perfectly anyhow. He said he was a hard foil man himself; had not bought five oz. of soft foil in twenty years.

Dr. Marshall, Little Rock, uses both foils. The trouble is due to the operator; to the power behind the plugger; not to the gold.

Dr. Freeman, Nashville, said the dark line at the margin was not always due to "the other end of the plugger." It was unprofitable to take up so much time in discussing the merits of cohesive and non-cohesive gold; the object is to preserve the teeth, and to do this we must use the material that we can use to the best advantage. If the gold slips, heat it a little and it becomes cohesive. In regard to the discoloration at the cervical margin, as long ago as in 1869 he read an article from Dr. H. S. Chase, of St. Louis, about the compatibility of tin to dentos, and began using it. On one occasion where he had put tin foil over a nearly exposed pulp, the tin slipped, and when finishing up the filling he noticed a dark crescent line at the margin, where a line of tin was visible, but that was certainly not an indication of decay! But he noticed later on that though those teeth had a predisposition to soften at the margins, the tooth in which the accident had occurred and the tin had slipped forward to the margin, was perfectly hard and sound; it appeared that tin was more adapted to cervical margins for its therapeutic effects. He was empirical to the extent of trying what was recommended by good authority, and continuing it when he found good results.

Tin does answer well at the margins, and for sensitive dentine; it also hardens the tooth structure of young teeth. Teeth that fail by other methods may be saved by tin linings, and the dark line at the margin, from the layer of tin does not indicate decay. If you put your gold where you want it, it will stay there if you don't disturb it. If you merely chunk in billets, and chunk them in the wrong place, you don't want them to stay. As Dr. Morgan said on another occasion it would be better if nine-tenths of our men would never attempt anything else but amalgam.

Dr. Winkler said that the great objection to tin was the discoloration it produces.

Dr. Freeman admitted the discoloration, but said that he always told his patients that it would discolor the tooth, but that it would preserve the tooth from future decay. A dark line at the margin, in his work, does not mean decay. The combination of gold and tin hardens the tooth, discoloring it by filling the tubuli with coloring matter. He knew that this was so, from practical tests and observation, but he wants to know why; he says, "I want the reason for the faith that is in me."

Dr. Louis Chisholm, Nashville, said that though a retired practitioner, no longer in the active ranks, he had listened with the greatest interest to the discussion, which called to mind the old fights in days gone by. He wished to call the attention of younger members to what had been as his *polar star* through life—that *demonstration* is the only witness that gives evidence to any fact of truth or science. When he was a young man, Dr. Shadown had come forward with very hard foil. He made many fillings, which to the eye seemed perfect, grand; but in less than two years the cervical margins were permeated with rat holes; you could run your penknife under them; little sinks of moisture undermined it all. It requires such skill as not one man in a hundred possesses, to fill to the cervical wall perfectly. It is better to begin with soft gold fillings. If you have got the skill to use the other, all right; you may

be the one in five hundred. But when retaining points are made in solid bed rock, and the gold built right at the margin, from one side to the other; moisture cannot enter, no matter if you leave a vacuum in the middle. Demonstration is the witness which will always testify to the truth.

Dr. Crawford said that though he did not ignore the advantages of non-cohesive or soft foil in certain cases, if he were compelled to confine himself to only one kind exclusively, he would take cohesive gold. Many fillings could be done with the latter that could not be done with the former. He said:—In what does the difference lie? Not in the make-up of the tooth; not in the shape of the cavity; not in the environment; it consists in the location and accessibility. If the cavity can be approached properly it can be filled with cohesive or with non-cohesive gold, as you choose. But where do you substitute amalgam for gold? It is where the cavity is so inaccessible that you cannot bring to bear the proper impact. This is the main point—the impact. The difficulty does not lie in the character of the material, nor in its introduction, but in the character of the impact. You want the minimum quantity of force. The means for complete condensation rest in the hand and arm which wield the instrument, far more than in any mechanical appliance and I predict that this will be recognized in less than a quarter of a century. If put to the test, it will be found that the proper use of the fingers, without mechanical aid, lessens labor, expedites operations, shortens the length of time necessary. It has been said that a greater weight of cohesive gold can be impacted than of non-cohesive; but gold is gold, and weighs the same the world over. If the cavity is absolutely full, the weight must be the same. The cardinal thought in the paper was the advantage of an established system, elevating the standard by which operating is controlled. In many large cavities the same result may be obtained—saving the tooth by either foil or with amalgam. By too severe malleting an inflammation of the gums is sometimes caused, bringing

out products that are damaging to the tooth. The physical functions of the soft structures are interfered with, and the tooth becomes very sensitive. Many teeth are lost by being beaten to death with the mallet.

Dr. Crenshaw said that he was surprised to hear Dr. McKellops say that he preferred the mechanical mallet, because the blow of the electric mallet was too harsh. It was strange that he had not found out that the blow of the latter could be adjusted very exactly to any degree of force, making it as light or as heavy as you want. As to Bonwill's mechanical mallet, Dr. Bonwill had himself undertaken to demonstrate in a clinic, the practical perfection of his mallet, but he created such inflammation and trouble in the tooth that it had to be extracted. It may have stirred up an old slumbering abscess, but he had the opportunity of selecting his tooth. Having personally inspected the filling, he could say that it was not well condensed; it was very porous. Dr. Crenshaw asked Dr. Rollo Knapp to endorse this statement. The electric mallet can be adjusted to do what never has been done before. There will be no discoloration if the work is properly done with the electric mallet.

On motion the subject of operative dentistry was passed.

Dr. Salomon said that others had probably, like himself, been annoyed in the use of the emery strips, etc., in use for polishing fillings. He found that a ribbon of watch spring, heated in an alcohol lamp and drawn through shellac, and then dipped in rotten-stone, or silex, or corundum, would be found an excellent substitute; very elastic, and not liable to catch on the margin of the cavity and tear.

Dr. Catching related a remarkable case of dental development, the subject being Miss Julia Wells, of Atlanta, Ga. She was born August 6th, 1871, (a premature birth, of six months) of parents very sound, with no hereditary taints whatever. She was very delicate and very small. At the age of six months she began teething, and at seven

months had a full set of small teeth. They were all lost within three months, and at eleven months she began cutting teeth again, at the age of fifteen months having a second set of teeth, which crumbled away like chalk. When two and a half years of age she weighed ten pounds and had a third set of teeth, which were a great source of irritation, causing inflammation and swelling of the face and under the lower jaw.

The mother carried the child to her dentist, Dr. T. T. Moore, of Columbus, S. C., (she was living there at that time,) to have the teeth removed. Dr. Moore thought best not to do so at that time; but she, persisting in her belief that they ought to come out, called on Dr. Boozer, who advised as Dr. Moore did. Not to be outdone, and to relieve her child, at her own risk, she borrowed forceps from Dr. Boozer and extracted twelve teeth of this set before releasing the child from her hold.

The teeth of the third set were all removed before she was four years old, after which her health improved rapidly. At seven years old she weighed thirty pounds. For several years she had no teeth, and then 3 or 4, shell like in form, appeared in front of the upper ridge, which were removed by the mother with her finger nails. Then she was toothless again until she was eleven years old, when she began teething again, cutting the fourth set, which are in her mouth sound and firm to-day. She is minus the two superior central incisors, one of which I removed on account of its position and one left superior bicuspid.

The lower jaw is minus the two right bicuspids, one left bicuspid and cuspid. The teeth were firmly fixed, apparently of good texture, not perfectly formed crowns. She uses them to good effect, although the jaws do not come together by about half an inch, and the lower jaw protrudes about one half inch. Up to two years of age she fed only from her mother's breast. Up to eight years of age she was given three times a day, cod liver oil and lime water.

Dr. Catching exhibited models of her mouth taken at different times.

Dr. Richards moved that copies of the casts and the history of this remarkable case be deposited with the Tennessee Historical Society, in memory of the present meeting.

Dr. Catching was requested to furnish the same.

Dr. Chisholm suggested that the President appoint a committee to consider the ways and means of establishing a permanent museum for the Southern Dental Association, in which might be preserved these, and other valuable specimens brought to the meetings of the Association.

Dr. Morgan said that this would necessitate a permanent location, and would tend to give the Society a local habitation as well as a name. The museum could be located at some central point where the Association could meet at regular intervals.

Drs. E. S. Chisholm, W. H. Richards, and G. V. S. Wright were appointed by the President as Committee on Museum.

A vote of thanks was tendered the Executive Committee, for the admirable manner in which they had performed their duties, and also to Dr. H. W. Morgan for his valuable assistance.

Dr. Freeman moved that the gavel be presented to the President, in testimony of the admirable manner with which he had wielded it.

Carried, with an amendment by Dr. Richards, that it be suitably engraved.

The President accepted the gift with brief but eloquent words of appreciation.

The selection of time and place of next meeting being now in order,—

Dr. McKellops said that if men from the West were expected to attend, a place must be selected where there would not be so much hot weather. They did not want to leave a hot place to come to one that was hotter. He

hoped that point would be borne in mind. If they came South, they would prefer to come in the winter, when warm weather would be acceptable.

Dr. W. W. H. Thackston said that, while very grateful for the delightful social and professional privileges he had enjoyed at the present meeting, his special business was to present the claims of old Virginia. He had come as a delegate charged with that duty. If he might be allowed to make a suggestion, he would ask that Hygeia Hotel, Old Point Comfort, be selected as the place of meeting. It was not necessary to name all its attractions, but he would only refer to its delightful surf-bathing, and all the luxuries which earth, air and water combined can offer. He commended the Association to accept the love and hospitality of Old Virginia; that his people would do all they could to make them happy, if they would accept our hospitality and that of Hygeia Hotel.

Dr. Teague said that when such a man as Dr. Thackston could leave his lovely home, with all its comforts and luxuries, to come to the hottest place on earth to invite us to a paradise, how can we reject his invitation?

Dr. W. H. Morgan said that in justice to Nashville, he would say that when the Association was invited to Nashville it had been expected they would come in May, and every arrangement had been made to have lovely weather. He had had no voice in the change of time, and had not been able to control the weather.

On motion, the rules were suspended, and the Secretary instructed to cast the vote of the Association for Old Point Comfort, Va., as the next place of meeting.

Dr. Thackston expressed his extreme gratification at the success of his mission.

Dr. J. Hall Moore stated that the hotel was open the year round. In selecting the time of the meeting he would advise them not to go there in the month of June, as the hotel was usually very crowded then. He hoped that the time for meeting would be selected with reference to that

of the International Congress on the 1st of September, and also so as not to conflict with the meeting of any other body, as had been unfortunately the case this year, conflicting with the National Dental Association.

Dr. McKellops thought the meeting should either follow close after, or precede the American Dental Association, also allowing time to go home before the Congress.

Dr. Catching said he had conferred with the chairman of the Dental Section of the Congress, and he thought it would be better to meet immediately before the Congress.

Dr. Teague moved that the selection of time, (and if found absolutely necessary a change of place also) be left in the hands of the Executive Committee. Carried.

Dr. McKellops said that he had been in attendance at the meeting of the Congress in London. Americans had received a perfect ovation. If we went to Washington at the time of the coming Congress it would be necessary to go with pockets full of money.

Dr. Richards said that in case the hotel at Old Point Comfort could not be obtained, he would suggest Virginia Beach, as in every way delightful, with no undertow.

Dr. Thackston stated that in the invitation to Virginia the Association was uninstructed in choice of place. Fortress Monroe, Norfolk, Virginia Beach, Ocean View were all most enjoyable places in summer time.

The election of President being next in order, Dr. McKellops nominated Dr. B. H. Catching.

Dr. Beech nominated Dr. J. Hall Moore.

Dr. Crawford nominated Dr. J. Rolla Knapp.

Dr. Prewitt nominated Dr. W. W. H. Thackston.

Dr. Thackston said that he appreciated the sentiment which prompted his nomination, which made this the proudest moment of his life, he felt that he had had his day; that the measure of his claims upon the Association had been more than filled. That though it would be most gratifying to find himself again among such friends another year, he

felt there were younger men better fitted to occupy the highest place in their gift. That he was an old man, on the down grade of life, and did not wish to stand as an obstacle in the path of younger men, who were more worthy than himself. He requested Dr. Prewitt to gratify him by making some other nominations.

Dr. Prewitt said that he could not agree to withdraw his nomination; that it was not true that he was passing into the sere and yellow leaf, for he was still active and efficient. He hoped that the Association would honor itself by voting for Dr. Thackston for President.

The nominations were declared closed, and Drs. Marshall and Johnson declared tellers.

On the first ballot Dr. Catching had fourteen votes; Dr. Thackston fourteen; Dr. J. Rollo Knapp five; Dr. J. Hall Moore eleven; blank one.

On the second ballot the name of Dr. Rollo Knapp was dropped. Dr. Thackston had nineteen votes; Dr. Catching eighteen, Dr. J. Hall Moore eight; blank one.

On the third ballot Dr. Thackston had twenty-three votes; Dr. Catching twenty; Dr. J. Hall Moore one; blank one.

Dr. Thackston having the majority of all the votes cast, on motion of Dr. Catching, the election was declared unanimous, and Dr. W. W. H. Thackston, Farmville, Virginia, announced as the next President of the Southern Dental Association.

Dr. Salomon nominated Dr. Catching for First Vice President, and on motion, the Secretary was instructed to cast the ballot.

Dr. J. R. Knapp was elected second Vice President.

Dr. W. H. Richards, third Vice President.

Dr. J. Y. Crawford, Corresponding Secretary.

Dr. Holliday, Recording Secretary, positively declining a re-election, Dr. L. P. Dotterer was elected to fill his place.

Dr. H. A. Lowrance was re-elected Treasurer.

Drs. J. Hall Moore, Richmond, Va.; E. S. Chisholm, Tuscaloosa, Ala.; J. R. Woodley, Norfolk Va.; Executive Committee.

On motion, adjourned to 2 P. M.

FOURTH DAY—SECOND SESSION.

Called to order at 2 P. M. Reading of the minutes dispensed with.

Dr. J. Hall Moore stated that he held a letter from Dr. R. Finley Hunt, addressed to the President of the Southern Dental Association, to appoint a committee of three to confer with a similar committee from the National Dental Association, the latter committee consisting of Drs. R. Finley Hunt, J. H. Coyle, E. S. Chisholm.

Dr. Teague said that he did not see that the Southern Association was called upon to recognize the National any more than the American Association. Let each one take care of itself.

Dr. McKellops did not see that the Southern Association had anything to gain from any connection with any other body. He had upheld the Southern through its darkest days; had helped to carry through our meeting when there was not a quorum in attendance. They were now prosperous and independent, and he thought it was better to remain so.

Dr. Salomon was opposed to appointing the committee. He would have each body stand on its own feet.

Dr. Catching said the object of the committee was apparently to prevent any further clashing of dates, but that was not likely to ever occur again.

Dr. Morgan said he did not want anything tending to any consolidation. It had once been proposed to wipe out both the American and the Southern Associations for the formation of a single National association, but no good had come of it. The Southern Association was now in good running order, ready to do efficient, harmonious work. He himself had been one of the hardest workers in

its organization, though it was true he had at one time become discouraged, and had dropped out, but others had kept on, and now he was ready to put his shoulder to the wheel again. This was the representative Association of the entire Southern States. He said: There was never such a representative gathering of our brethren as we have here to day. I love my profession and I love my brethren. I have given it the ardor of my young manhood, and the vigor of my maturity, and I glory in its success.

Dr. Chisholm said he would give honor to whom honor was due. The Southern Association had been very small at one time. Then Dr. Morgan said: "You Southern people will not come to us; we will not come to you. We will build up the American Association." Now Dr. Morgan is ready to say, "*See how we apples swim,*" but I am glad to know he is coming back to us, though he did once give us the cold shoulder. After the meeting at Augusta, Ga., Dr. Morgan said the papers read before the Southern Association were not worth the paper they were written on. I am glad he thinks better of us now. I was present at a meeting of the National Association four years ago, when on my way to preside over the Southern, but I have not attended a meeting since. I hope to live to see the Southern the leading representative body of the profession, and hope I shall live to rejoice in its fullest success.

After some further discussion, the vote was unanimous not to appoint a committee of conference.

The President, in brief but well chosen words, offered the Association his congratulations on the success of the meeting, thanking those who had so faithfully worked with him, supporting and sustaining him in his efforts. He then retired from the chair he had so ably filled, and the officers-elect were installed. The Association then adjourned to meet on Monday, at the office of Dr. W. H. Morgan, for clinics and final adjournment to Old Point Comfort, for the meeting of 1887.—*Southern Dental Journal*.

ARTICLE III.

OXYGEN AS A THERAPEUTIC AGENT.

BY C. E. EHINGER, M. D.

CLINICAL CASES.

CASE 6.—Mrs. H., aet. 33, widow, came to me early in January upon the recommendation of some former patient. States that she had been unable to perform her household duties for about three months, during which time she had been under the treatment of several physicians without any improvement. Her most urgent complaints at the time were insomnia and migratory rheumatism, to which she adds the following list of secondary troubles: anorexia, flatulent dyspepsia, obstinate constipation, and dysmenorrhœa. The simplest food in small quantities caused much distress from distention of the stomach and abdomen and sour eructations. Bowels rarely moved without the aid of laxatives or enema. Rheumatic pains very annoying at all times but much aggravated every morning. Was always awakened by pain which at one time was in the shoulder, then the hip, elbow or ankle.

She was put upon what I term the standard mixture, consisting of oxygen, two volumes; nitrous oxide; two volumes; air, four volumes; commencing with four inhalations daily which were increased gradually until eight inhalations were taken at a treatment. The very first treatment was productive of the happiest results, patient announcing with much satisfaction the next day that she had enjoyed the best night's sleep she had had for months. During the first week little change was noticed in the gastric and enteric symptoms, although she thought she had more desire for food, but still felt distressing after eating. At the end of the second week noticed marked im-

provement in the appetite, less pyrosis, bowels moved without enema or laxative, though not without some difficulty. Still said she was much troubled with burning in the epigastric region. These symptoms all improved gradually, and a little before the expiration of the month she discontinued the treatment, declaring herself well, which appearances certainly seemed to indicate as she had gained much in flesh and strength.

CASE 7.—Mr. L., aet. 62. Has been a sufferer from asthma and bronchial catarrh for ten or twelve years. The first approach of cold weather has always been a signal for the onset of severe asthmatic symptoms, which not only rendered business burdensome but at times an impossibility. Often paroxysms so severe that he was obliged to spend the night in the easy chair owing to the distress occasioned by a recumbent posture. He began the use of oxygen in January while suffering from a severe attack. He was put upon the modified mixture, two small treatments daily. Pure oxygen was given during the severe paroxysm with the effect of removing the most distressing symptoms at once. Dyspnœa and cough improved from the first, so that at the end of three weeks but one small treatment—of four inhalations—daily, was given. This was continued for a month longer. After the first week there was no return of the distressing symptoms and a decided improvement of the bronchial trouble was manifest. This gentleman remarked incidentally that his bowels had not acted so regularly for years as since commencing the oxygen treatment.

CASE 8.—N. C., aet., 30, colored coachman. Was under treatment for tubercular phthisis at the time I put in my oxygen outfit. As soon as arrangements were completed, he was placed upon the mixture. Condition at this time was as follows: He was confined to his bed, much emaciated, unable to take even liquid nourishment without causing pain in stomach, and greatly aggravating a troublesome diarrhœa. Suffering from profuse night-sweats, bad

cough with profuse blood-streaked expectorations, temperature ranging between 100° and 104° . Physical examination.—Numerous moist rales heard at the apex, with signs of two small cavities. Bronco-vesicular breathing in the mammary region. Entire absence of vesicular sounds in subscapular and infra-axillary region. Oxygen was sent to this patient in a rubber gas-bag. The usual proportion was administered at first, which was changed after four or five days, by increasing the proportion of oxygen one volume. The rapidity with which this man gained was almost beyond comprehension. The night-sweats were soon checked, cough and diarrhoea diminished rapidly, temperature declined so that the evening rise was not over 101° . At the end of the first week he put his clothes on and walked about the house, and by the middle of second week surprised me by walking to my office, a distance of three quarters of a mile. In a few days after this he came regularly to my office for treatment. At the expiration of three weeks he wanted to go to work, but to this I would not give my consent; he, however, did some light work about the house. In a month he had gained fifteen pounds. Coughed but little, slept well and had an enormous appetite. But alas! here the good report ends, for about this time an incident occurred which changed the tide of events, and blighted the hopes I had begun to cherish of reporting a case of advanced phthisis arrested by the oxygen treatment. The domestic misunderstanding which resulted so disastrously to my patient and indefinitely postponed the hope I had cherished, was something as follows: One cold night in January the patient under consideration be-thought himself that a fire in his sleeping apartment would add very materially to his comfort and well being, but this announcement was greeted by his aged mother as an unwarranted extravagance, for the very thought of which he was severely admonished, and sarcastically reminded that the summer kitchen was warm enough, a night like that, and withal good enough for a worthless being who would

harbor such high-flown notions. The upshot of the matter was that our patient repaired to the summer kitchen, built a fire in a rickety stove there, and turned in for the night upon an ironing board. Toward morning, the fire having gone out, he awakened with a chill, and the next day had a slight hemorrhage. From this time on the oxygen proved unavailing, and in a month's time the patient ceased to be.

I realize that some of my hearers will smile at the inglorious termination of the case and mentally scoff at the idea of the occurrence related being even indirectly responsible for his death. Be that as it may, the writer will ever adhere to the conviction that his promising patient was sacrificed a martyr to rigid economy and willful cussedness.

CASE 9.—Mrs. W., aet. 37, married, came to me for the relief of an unusually obstinate cough, of between four and five years standing. Has been under the treatment of a most excellent physician, who had studied her case carefully and done everything in his power for her relief, but failed to give more than temporary benefit. Cough was paroxysmal, severe seizures occurring at night which continue uninterruptedly for half to three-quarters of an hour, and are often frequently repeated, thus greatly interfering with and sometimes abolishing sleep. Paroxysms frequently occur while eating which compel her to retire from the table, and sometimes result in her losing what food she had taken. At times complains of circumscribed soreness in upper part of right lung. Repeated examination of lungs have been made by her physician but always with negative results, nothing of importance being discovered. It was thought that the presence of an hypertrophied tonsil and slight follicular pharyngitis might be the cause, and they were energetically attacked and much relieved, but with no effect upon the cough. The question of "trigeminal cough," "liver cough," "ear cough," "stomach cough," "ovarian," "uterine," and various other coughs were successively canvassed, and duly discarded as untenable. Some good ground existed for considering the cough of gastric origin, since the patient was a great sufferer from atonic dyspepsia, accompanied by an usually torpid state of the bowels, no evacuation occurring sometimes for a week unless enemas

were resorted to. All the ordinary and some extraordinary remedies were tried unavailingly, much to the disgust of both patient and doctor. For some time before commencing the use of oxygen the patient had taken no treatment whatever. Hearing of a similar case being cured by oxygen she consulted me and finally decided to give the oxygen a trial.

I feel some hesitation in giving the exact results obtained, lest either my veracity or sanity be questioned; however, as "truth is mighty," I will risk the consequences and state the unvarnished facts. The first treatment was followed by a night of perfect rest uninterrupted by a single seizure of coughing, something unknown for over a year. I do not mean to convey the impression that the cough ceased forever, but it did continue to improve steadily. The appetite returned, gastric symptoms disappeared and the constipation was much relieved, though in this case, not cured. The treatment was taken for a month, patient deeming further treatment unnecessary. I will briefly relate one more case before bringing my already too long article to a close.

CASE 10.—Mr. C., æt. 33, married, an engraver. One year ago last winter, he suffered a severe attack of double pneumonia; perfect resolution did not result, indurations remaining in both lungs; he also continued to have a troublesome cough and dyspnœa. Lung capacity on commencing treatment was 154 cubic inches. In two weeks it had increased to 175 cu. in., and both cough and dyspnœa were much diminished. Patient took the treatment a month, at the end of this time he thought his lungs as good as ever, chest capacity in the mean time having increased to 210 cubic inches.—*Medical Current.*

Editorial, Etc.

DENTAL STUDENTS.—The large increase in the number of dental students now in Baltimore is very gratifying to all in-

terested in dental instruction, as this city has been designated the "Mother of the American System of Dental Surgery." When the writer entered the dental profession some thirty years ago, twenty-seven of which have been devoted to dental teaching, the average number of students seeking a professional education was not more than forty, and after waiting for more than a quarter of a century he is at last gratified in being able to announce that at one dental school alone in Baltimore, the *Dental Department of the University of Maryland*, the number of students now present is *one hundred and twenty*.

It is but natural that Baltimore, where the first effort was made to rescue the profession of dentistry from a mere pursuit followed by uneducated men, should become the acknowledged centre of dental education, and that her schools should be patronized by those who care more for what they acquire in the form of knowledge, than in the form and name of being a "Doctor of Dental Surgery."

When the writer first became connected with a dental school, there were but three in existence, now such schools can be found in every part, almost, of this country. Outside of the large cities, the mistake of establishing such schools is apparent in the lack of material for practical experience. To furnish such material, apart from that portion of the inhabitants able and willing to pay the usual fees to local practitioners, requires a large population, and to endeavor to teach dentistry without a large supply of Infirmary patients is to utterly fail in such an undertaking. Small fees may be an inducement, but such fees become more costly than larger ones, if the facilities for practical experience cannot be furnished. With a population approaching nearly to half a million, the supply of clinical material is necessarily large, and Baltimore cannot fail to meet this important and essential demand of her dental schools.

THE POINT OF DEATH.—*When Dissolution Occurs a Matter of Grave Uncertainty.*—Although usually it is easy to tell when dissolution has occurred, yet there are cases which occur from time to time rendering the matter one of very grave uncertainty. The point at which the soul relinquishes the

body is among the most difficult things to establish. Perhaps this uncertainty is one of the reasons why there is such curiosity as to death-beds and last words. We are anxious to know how affairs appear to those who are passing away. They are undergoing the great change through which every one must pass.

How does it look to them? Very little more information is to be gathered from the dying than from the dead. Certain inferences may be drawn from the surroundings—the departing color, the cold, deepening stare, the groan, the rattle in the throat, the stiffening limbs: but they are as likely to mislead as not. And the same may be said of the death sayings. They are as enigmatic as the declarations of the oracles. We may take sometimes half a dozen meanings from them, as, for instance, Goethe's "More light!" Was it the sense of earthly darkness growing around him, or was it the breaking of the eternal light upon his vision, or was there yet some deeper significance in the exclamation?

Medical works show that people have been resuscitated fifteen, twenty, and even thirty minutes after apparent death. Heldon, the highwayman, is said to have been dead three-quarters of an hour. His body was cut down after hanging that length of time, and was handed over to his friends after a thorough examination. That night he was seen as well as ever except for a stiffness of the neck. Pryce, the Norwich miser, was dead as Cæsar, according to those about him, and until some thoughtful person, distrusting the warmth of his hands, administered a stimulant. He arose and lived years afterward. Cases of mere trance are almost innumerable.

Supposed deaths from drowning show that resuscitation may take place thirty or forty minutes after all life has apparently left the body. The question as to what becomes of the soul in this long interval is the one which puzzles many. But the chief point of the matter is that the physicians and friends should not too readily accept appearances in the critical hour. There may, as in the Frazer instance, be yet some spark of life remaining. As Dr. Lackerstein claims, there is absolutely no reason why, with the resources he employed at hand, any one should die of an overdose of chloroform or from a shock while undergoing a surgical operation.—*Ex.*

Bibliographical.

A PRACTICAL TREATISE ON MECHANICAL DENTISTRY.—
By Joseph Richardson, M. D., D. D. S. Fourth edition, revised and enlarged. Publishers: P. Blakiston, Son & Co., Philadelphia, 1886. Price, cloth, \$4.50; leather, \$5.50.

The new edition of this well-known and highly prized work, contains 703 pages and 458 illustrations, some two hundred and sixty pages more than the third edition, and seventy-three more illustrations. One hundred and ninety-three pages are devoted to artificial crowns on roots and bridge-work. Speaking of facial individuality the author remarks: "Each separate feature—as the eye, the nose, the mouth, the teeth, facial contour, complexion, temperament, etc., contribute to this individuality, and no one special feature more, perhaps, than the teeth. There are few more repulsive deformities than those inflicted by the loss of these organs, and none more fatal to the habitual and characteristic expression of the individual. It is the special mission, as it is the first and highest duty, of the dentist to preserve this individuality intact, and an equally imperative duty to restore it as perfectly as possible when impaired. To fulfil in the most perfect manner possible this most difficult of all the requirements of prosthetic practice implies an art culture that is competent to interpret the distinct play of the features associated with individual physiognomies, to differentiate individual temperaments and make available the sculptor's and painter's perceptions of the subtle harmonies of form and color. To the failure or inability to properly comprehend the practical import or significance of individual characteristics, so far as they find expression in the teeth, and the consequent failure to conform our methods of replacement to the imperative requirements of art, may be fairly ascribed the deserved reproach into which prosthetic practice has fallen, and not, as is generally charged, to the employment of any particular material or methods concerned in the mechanical

execution of the work." The work now before us is a credit to its author and must prove a valuable assistant to the student as also to the dental practitioner. The publishers should also be commended for the typography and preparation of this volume, which presents a very handsome appearance.

INDEX TO THE PERIODICAL LITERATURE OF DENTAL SCIENCE AND ART.—As presented in the English language. By J. Taft, M. D., D. D. S. Publishers: P. Blakiston, Son & Co., Philadelphia, 1886. Price, \$2.00.

This valuable contribution to dental literature is in the form of an octavo of 212 pages, and a perusal of it shows that it embraces a useful index to the periodical literature of dentistry, dental periodicals and authors. To all in search of the valuable contributions to dental science and art that have appeared from time to time, and there are few progressive practitioners who do not have occasion for such research, this work will prove a valuable and time-saving aid. This work furnishes a list of all journals published since 1839, with the editor's names, etc., and an alphabetical list of the subjects of all dental articles with the names of the authors and journals in which such appeared. It also gives an index of authors contributing to dental literature, and cannot fail to prove greatly useful. Its subject matter is divided into: Index to the periodical literature of dentistry; Index to dental periodicals; Index to authors of dental literature.

Monthly Summary.

IMPROVED METHOD OF OPERATING FOR CLEFT PALATE.—A correspondent writes to *The Lancet*, concerning what he considers a great improvement in the operation for cleft palate. Hitherto great difficulty and not a little danger have arisen from hemorrhage during the operation, necessit-

ating frequent and very skillful assistance, periodical discontinuation of the anæsthetic, and distinct intervals in the performance of the operation. In addition to these, other and minor troubles are experienced. All these difficulties may be avoided, and the operations rendered perfectly safe and easy, by the simple process of inversion as apply to the head only. This can easily be attained by bringing the patient's shoulders well up to the end of the operating-table, and allowing the head to hang over the edge in the fully extended position. In this position the roof of the mouth would be horizontal or slightly inclined downward towards the operator, who should stand at the head of his patient. The anæsthetic is given through the nose by a small tube, and is quite out of the way of the surgeon. Only one assistant is required, who should stand to the left of the operator. In paring the edges, no change of hands is required, but the corresponding hand should be used in elevating the tissues of the hard palate, and in passing the sutures. Under these circumstances no blood can enter the larynx or œsophagus, the palate remains unobscured by blood, and whatever hemorrhage occurs finds its way into the nasal cavities, and at the conclusion of the operation may be emptied by simply turning the patient's head to one side.

SWALLOWING A SET OF ARTIFICIAL TEETH.—A remarkable surgical operation was performed at the Massachusetts General Hospital by Dr. Maurice H. Richardson, of Boston. About a year ago John McCarthy swallowed a set of artificial teeth. The passage of food to the stomach was almost wholly prevented, the patient grew emaciated and weak and it became evident that unless relief was had he must soon die. Dr. Richardson made a transverse cut in the left side of the abdomen, through which the man's stomach was drawn out and then cut open, when by the insertion of his arm to the elbow Dr. Richardson was able to reach and remove the teeth. The internal opening was then closed with fine silk and the stomach replaced, the external cut being closed with stitches. The whole operation was completed in forty-five minutes. The patient is doing well and his complete recovery is now considered little less than certain.

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ARTICLE I.

POST-GRADUATE STUDY.

BY J. D. MOODY, D. D. S., MENDOTA, ILL.

"A college training is an excellent thing; but, after all, the better part of a man's education is that which he gives himself."

JAMES RUSSELL LOWELL.

I propose making this sentiment the key note of my paper. On two former occasions I have presented the subject of dental education,* and my intention is to take up at this time only one phase of this question, that of post-graduate study; to show its need, to outline a scheme of study, and to devise a plan for carrying it out. I believe that there is not a gentleman present who does not realize that some further elaboration of our educational scheme is, to say the least, desirable. Very many there are who think it imperative. To those who care nothing for a true scientific culture, and to whom the proper insertion of a beautiful filling or of an artistic denture is the *ultima thule*

* Ohio State Journal of Dental Science, July, 1893. President's Address before the Central Illinois Dental Society, October, 1883.

of dental ambition, this paper will have no interest. But to those who are longing for something better either in themselves or in the general profession, something which "will foster in us that spirit of broad and liberal thinking which is the essence of true scientific culture," to them I offer these suggestions as a partial solution of the question.

A physician is reported as having recently said that the practice of medicine in the near future is to be largely hygienic and sanitary, rather than one of drug prescribing. This may be rather a rosy view of the case, and yet it contains some truth; and while in all probability we will never get beyond the necessity of tooth filling, the time is surely coming when the dental surgeon will be assigned the lower seat and the dental doctor will be given the higher one. But before this time comes there must come a change in our educational methods. In a late number of the *Medical Record* there is an editorial on "Practicality in Medicine," in which the writer warns the profession against going to the extreme in making theory secondary to the practical, and uses the following language: "In our anxiety about the superstructure are we not getting careless about the foundations?" May not this apply as well to ourselves? Do we as dentists possess the foundation principles upon which to build a truly scientific superstructure? They are not to be found in the curriculum of any college. Even did they exist there, the usual two years course would be too short a time for their proper study. Three years would not give time enough. The mind of the average matriculate is not sufficiently matured to carry on such work. A young man destined for the ministry passes through the high school, then four years of college, and finally three years of seminary work. Can we be contented with anything less? As I shall show farther on, the list of subjects upon which every intelligent dentist should be fairly well informed, is far greater than any present college curriculum, and greater than under present circumstances it is possible to embrace in college

work. A man cannot well remain in school long enough to gain that knowledge upon which to build great scientific laws, and it is folly to expect the student to pursue them beyond college life without some other incentive than the mere acquisition of knowledge. Of course there are men here and there, who can by sheer force of will accomplish this, but our aim should be to raise the profession as a whole to this high standard. How then are these foundation principles to be acquired? It must be by a life of study. A man can hardly begin serious work before the age of forty. He is then just in his prime, and, if the proper foundations have been laid, he is in a position to begin original work and render valuable service to his profession and to the world.

Are we, as dentists, making the most of our privileges? It seems to me that we are not; for, in glancing over the files of dental journals for ten years past, I was struck with the fact that so few new names have come to the front. You could almost count them on the fingers of your hands. Perhaps our profession stands as well as others in this regard, but I am sure this is not as it should be. In this country there are from fifteen to twenty thousand dentists. We can just as well be a generation of dental scientists as a generation of dental shopkeepers; but this will depend upon whether we lay the proper foundations. But about these foundations. Let me quote the opening paragraph of a paper read by Dr. Williams before the First District Dental Society of New York. He says: "I am sure you will rightly apprehend me when I say that the daily routine of details which goes to make up the practice of our specialty is not calculated to foster in us that spirit of broad and liberal thinking which is the essence of true scientific culture, and that it is therefore good for us to occasionally go back to a consideration of those *first principles, which are the foundations of all specialties.*"* The italics are mine. And this paragraph from Lionel

* Cosmos, March, 1885, page 129.

Beale. "The observer who aims at studying the remarkable and highly interesting phenomena of germination, growth, and multiplication of the bioplasm of cells or elementary parts, in the tissues and organs of man in health and disease, will find it advantageous first to investigate those processes in the simplest living beings, where they occur under conditions less complex. * * * *

The observer will learn many most important facts by watching the germination of the common mildew, and studying the different appearances of the plant when developed under different circumstances. * * * *

The mode of origin and multiplication of a bacterium and the growth of a spongiola of a plant may appear to be questions far indeed removed from the province of medical inquiry, and yet, we shall find that by such investigations only can we hope to determine the nature of some phenomena, the true explanation of which lies at the very root of a knowledge of the real nature of the disease. * * *

* Let not the student of medicine, therefore, conclude that the multiplication and growth of the lower forms of animal and vegetable life are not in his province. *There is indeed, scarcely a department of natural knowledge which does not bear more or less directly upon medicine.*" * Again the italics are mine. If this is true of the student of medicine, how much more is it true of the student of dentistry? Now what are these "first principles" to which Dr. Williams alluded?

Taking up his article, "Molecular Structure and Force with Reference to Nutrition," it will be seen that to read it understandingly it will be necessary for us to have a fair knowledge of the theory of molecular dynamics, also of chemistry, inorganic, and the more complex organic, and of chemical physics. Truly that is getting down to first principles. And how about the statement of Lionel Beale? Just what shall be the scope of these studies of ours; in what department of natural knowledge?" I answer, in

* The Microscope in Medicine, London, 4th ed., pages 135 &.

every thing that in any way bears upon the life history of organized matter.

Let us take a look through the library, and see whether this statement is too sweeping. I select a book here and there indiscriminately. First I take up some volumes of the "Independent Practitioner," containing articles on micro-organisms, by Dr. Miller. These theories and facts are of the utmost value to the dentist, but to thoroughly understand them we must be acquainted with all the teachings of microscopy and of bacteriology, and this latter must be based upon a previous knowledge of vegetable morphology and physiology and cellular metabolism, and this latter again upon molecular physics. Also a knowledge of chemistry and of chemical physics will be needed, and of animal anatomy and physiology as well. The little work on "Formation of Poisons," by Dr. Black, will require an equal range of knowledge on the part of the reader. Take up Foster's Physiology, or turn to the article on Physiology by Foster in the "Encyclopædia Britannica." To read these intelligently all of the above quoted studies must be thoroughly in mind, and in addition will be needed a knowledge of the lower forms of vegetable and animal life and of electricity. Here is a volume of the "Dental Register" for 1885. I turn to an article by Dr. Frank Abbott, on "Microscopical Studies upon Absorption of the Roots of Temporary Teeth." On attempting to read it, it will be found that we will need microscopical experience of no mean order, indeed of the very best, as also a knowledge of chemistry, cell metabolism, histology and anatomy. Next I pick up a little pamphlet published by Dr Barrett, of Buffalo, on "Nervous Force, Its Origin and Physiology." This is a subject with which we have much to do, and to have a good understanding of this article we must be at home in molecular physics, chemistry, anatomy, physiology and histology. Take down the last volume of "The Reference Handbook of Medical Sciences," turn to the article "Endothelium," and

see how our previous teachings have been at fault, based as they were upon erroneous deductions drawn from imperfect embryological investigations. With the development of the dental tissues, at least, we ought to be familiar. Dr. Atkinson has well said, "Direct interrogation of nature through embryological investigation to get at physiological changes, and examination of specimens under the microscope of tissues affected by diseased action, form the only possible way to arrive at a discriminative ability that will at all meet the demands of a high ambition to know."

Look through the files of the "Cosmos" or other dental journals, or of any medical journal, and notice the articles on nutrition, embryology, development, metalurgy, chemistry, etc., etc. It will require a high order of mental culture to be able to read them with ease and profit. Do you not see the Lionel Beale's statement, previously quoted, "There is indeed, scarcely a department of natural knowledge which does not bear more or less directly upon medicine," etc., is not too broad in its claim?

On every commencement day the advice is given to the graduates to keep apace with the current literature of their profession. It is good advice, but can be only partially followed out, for, as a rule, the graduates do not have the preliminary knowledge to enable them to grasp in detail a large part of it.

I believe that on an average, graduates are about twenty-five years old. At forty the man is in his prime; his intellectual faculties and his physical being are at their best. Could the spare moments of these intervening fifteen years be devoted to systematic study, they would fit the man at forty or forty-five to grasp the great problems confronting the profession, with an intelligent energy that would surely be productive of great results. The ripened years from forty to sixty-five, devoted to research, would lift the dental surgeon to the rank of a dental scientist. According to this plan, college life would be but a preparation of the ground for foundation building. From

twenty-five to forty, the foundations would be in process of laying, and the superstructure erected in the afternoon of life.

But just what lines of study should be taken up in this work? To get at the more advanced thought in this direction, I addressed letters to several of the most widely known educators in the dental profession outside of our own state, asking them to outline briefly a plan of post-graduate study, "such as would be required to make a thoroughly scientific dentist." The burden of each reply was, more study. I quote from some of them to let you see what others are thinking about this matter. Dr. Barrett says: "There are many of the medical branches that are closely connected with the practice of dentistry. A graduate from a dental college should comprehend them, but his knowledge must be obtained by after study, as they are not in the dental curriculum." He enumerates advanced work in microscopy and histology, practical and experimental physiology. He further says: "In natural physics no one should neglect the study of the Forces. The Conservation and Correlation of Force should be carefully studied. Then the student is ready to take up Tyndall's Floating Matter in the Air, and Magnin's Bacteriology, without a study of which, one is not prepared to comprehend general physics." Dr. Wm. H. Atkinson, whose suggestions always carry great weight, writes me, (in addition to the sentence previously quoted,) the following, to which I desire to call especial attention: "I know of no dental college, and for that matter, of no medical college, that so instructs its matriculates as to make them possessors of even the alphabet of the molecular changes through which elemental substances pass in the production and maintenance of functioning bodies liable to the manifold activity, known as weakness and disease." Also the following sentence: "It is almost daily experience that the present demand of really earnest young men is for that which cannot be found without very extensive reading of

text books and journals, and a long series of observations in practical studies, whereby they may become masters of diagnosis, prognosis and prescription."

Dr. Frank Abbott, Dean of the New York College of Dentistry, who knows from experience how difficult it is to raise the standard of dental education, fears he may be considered extravagant in only demanding a thorough knowledge of anatomy and surgical anatomy of the head and face, the microscopical study of the teeth, their surroundings, and the pulp in health and disease, embryology, certainly as far as the development of the teeth are concerned, etc.

Dr. Taft, who, as teacher, editor, and author, is so well qualified to speak authoritatively, says, "the ordinary graduate usually has only a foundation upon which to build; most of the studies should be pursued much further than is required for graduation, and most branches that are not required at all should be taken up and studied. * * * * Gynecology, also should be more thoroughly studied; also comparative odontology. A far more extensive study of oral pathology and surgery should be required." And then he makes a suggestion in regard to advanced study, which I will only mention, as it is foreign to the thought I desire to develop; and yet I think it a very important one, indeed, and worthy of careful consideration by thinking men. His idea is to arrange an advanced course, embracing four years of study and work. Those entering upon it would have it in view from the beginning; their work would be more thorough than that of the student competing for the D. D. S. Then when this has been fully accomplished, he would recognize it by conferring the degree of *Master of Dental Surgery*. This plan is worthy of a paper itself. But I recognize the difficulty of inducing any large number to enter upon this extended and expensive course of study. So long as one can graduate in two years and stand on the same legal footing with others, there will be a difficulty in securing students

for the advanced course. But further than this there are at present hundreds in the profession who feel the need of just such work, but to whom it would be impossible to close up business for four years to enter upon such study. It is to this large class that my plan would be especially applicable.

But about the special studies. Out of my own experience in study and from long thinking on the subject, I have arranged the following scheme of studies. I would have them follow each other in about the order named, and preferably pursuing only one study at a time.

- Physics, molecular.
 - mechanical movements.
- Electricity, magnetism.
- Chemistry, inorganic.
 - organic.
 - chemical physics.
- Metallurgy.
- Microscopy, technical.
- Zoology, invertebrate, morphology.
- Botany, systematic.
- Anatomy, human.
 - comparative.
- Embryology.
- Odontology, comparative.
- Histology, vegetable.
 - animal.
- Physiology, vegetable.
 - animal.
 - chemical.
- Bacteriology.
- Pathology, general.
 - dental.

You will notice that I have not included in this list special disease or remedies, and general knowledge has not been considered at all. Further you will notice that each study follows logically upon the one which precedes it. I

do not expect that any one would master these subjects in the allotted fifteen years. I would only expect a working knowledge of these to be obtained in that time. The best use to make of a library is not to sit down and try to master its contents, but to find out what information it contains, and where and how to obtain that information when wanted for use.

At forty or forty-five I should expect a man to have a good working knowledge of these subjects, and in all probability to have developed an inclination in some one direction of study, and then, and only then, would he be in a position to attempt real work or to have an intelligent understanding of such work when presented to him.

I do not see how any one study in this scheme can be left out, but I want to call especial attention to organic chemistry, as of vital importance to us, and yet hardly touched upon in college work; the same can also be said of chemical physiology. Bacteriology, too, which underlies the very foundations of dental pathology, has not received the attention it merits, and without radical changes in our methods of teaching cannot be properly taught in our schools.

I have only included in this list those branches, a knowledge of which it will be necessary for us to obtain, in order that we may have anything like an idea of the basal principles upon which our profession rests, and without which we cannot hope to grasp the meaning of, much less formulate, great scientific laws. A man may fill a tooth or treat an abscess without having acquired all this information, but without it his treatment is largely empirical. When the mass of the profession come to lay these solid foundations, a long stride will have been taken towards lifting our practice out of the empirical into the scientific.

Again, if we have the high ambition to make our profession a truly scientific one, we should do everything in our power to make it attractive to cultured minds. We can, if we will, gather the educated young men about us.

It is within our power to make the name "dentist" an honored one. But to do this we must make our work appeal to the intellectual rather than to the sordid side of man's nature.

And again, in this day, when the tendency is to subdivide every branch of knowledge into specialties, the most work, and the best work is done by the man who, after having laid the proper foundations, devotes himself to one of these subdivisions. It will be necessary for any one who hopes to make a decided mark in his calling to first lay the broad foundation which I have indicated.

Now comes the question about which the greatest diversity of opinion may arise, namely, how shall this course of study be carried out? First, the plan suggested to me by Dr. Taft could be adopted, and the outline of study I presented, or any similar one, be carried out. This however, requires an attendance at school of at least four years, with its consequent expenses. The higher degree of Master of Dental Surgery would of course be quite an incentive to undertake this course. Secondly, the busy man, who could not give up practice to attend school, and yet has a real desire to know, by using this outline of study as a guide to a simple course of reading, could in a few years acquire a creditable fund of information.

I would not repress individuality in this work. A man's work must be part and parcel of himself, the outgrowth of his own mind, if he would have it make an impression upon the world. Yet there must be a certain uniformity in plan and methods among those who are working towards a common end.

The want of some plan in study, the knowing just what to take up, and in what order to make the most of it, has been felt and expressed many times. I have felt it myself. Some can formulate such a plan themselves to the very best advantage. The majority cannot. To meet some such want as this, has been my aim in presenting this tabulated course of reading. I am confident that for

this purpose it will leave little to be desired. The individuality will have room for play when the foundation principles here laid down will have come to be put to practical test.

Lastly, the plan, which, all things considered, I think would be productive of the most good, is that of a Post-Graduate Correspondence School. Educational authorities throughout the country are coming to recognize the value to the busy man of this method of teaching. It has been put to a practical test in a score of places. Institutions of learning, scientific societies, and other bodies are using this means of instruction with increasing satisfaction. Under this system the members of the school do not leave their homes. They engage in all their usual vocations, and thus are not at expense of time or money. The instructors in each department should be thoroughly capable men, appointed to their position by the directors of the institution. It would be necessary to prepare text books, for it is a lamentable fact that we have not to-day a properly prepared dental text book. They must be accurate, abreast with the latest thought, and moderate in price. An exhaustive treatise is not a proper text book. Something after the plan of those used in Huxley's School of Biology, at South Kensington, would be needed. Such books should be prepared under the authority of some inter-collegiate organization. The pupil's work would be guided by correspondence with the tutor. Written examinations at monthly intervals, and yearly personal examinations probably should be held.

Only one, or at most two branches, should be carried on at a time, and the student should be unlimited as to time in which to do the work. This work should be thorough, and it is possible to make it so, and when accomplished it should be recognized by a degree meaning something. It should mean more than Doctor or Master of Dental Surgery. I would suggest D. D. Sc., standing for Doctor of Dental Science. Instead of calling this

institution a School of Dental Surgery, I would call it an Institute or an Academy of Dental Science.

But we should organize such an institution? It should be left neither to personal nor to any college ambition to take up and so risk its standing. It could best be carried out through some national organization, such as the Association of College Faculties, the Association of Dental Examiners, or by a body of directors, constituted for this purpose by some such organization.

I expect the objection will be made that the busy practitioner has not time for such work. This objection has been made and met time and again. "When there is a will there is a way." "What man has done, man can do again." We owe it to our profession, to our fellow men, to ourselves, that we make the most of our privileges, and live not for self alone. Allow me in this connection to quote the words of one who has had much to do with educational methods, who has come in contact with men in every station of life, and who has made a special study of this method of education. He says: "There are thousands of full-grown men * * * who are at their best intellectually, and who, with some leisure and much longing, believe they could do more than read. They want to study; to study in downright earnest; to develop mental power; to cultivate taste; to increase knowledge, to make use of it by tongue and pen and life. * * * They believe they could think and grow, speak and write. They are willing and eager to try. Out of minutes they could construct college terms. They have will enough, heart enough, brain enough to go on, to go through; and all this while the everyday life continues, with its duty for this hour and for that. They believe that into the closely woven texture of every-day home and business life, there may be drawn threads of scarlet, crimson, blue, and gold, until their homespun walls become radiant with form and color. *

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* The Chautauqua Movement, Dr. J. H. Vincent, p. 178.

It is probably true that the full benefit of this scheme would most likely accrue to the young graduate who has long years before him, but any one with the desire, by going at it systematically and using the spare moments, can accomplish it all. I expect that some will consider me extravagant in these demands, will consider them chimerical, but I believe in them, for they are born of my convictions, and I verily believe that in some such line as this much of our future educational work is to be done.—*Dental Register*.

ARTICLE II.

ACCURACY AS A CONDITION OF SCIENTIFIC PROGRESS.

BY J. SMITH DODGE, JR., M. D., D. D. S., NEW YORK.

[Read before the Dental Society of the State of New York, May, 1879.]

A RETROSPECT.

The number of things which a practicing dentist ought to know threatens to become overwhelming. Those who can remember the novelties introduced within the last twenty-five years will be equally astonished, on making the survey, that such a revolution could occur in such a time, and that any art could endure such a revolution and yet remain essentially the same. It is now about twenty-five years since the profession began to appreciate the cohesive-ness of pure gold, and to use this quality in filling teeth. One of the first results was a demand for more perfect dryness than any previous means afforded, and the imperative demand produced that master-piece of invention, the rubber dam. But the rubber dam does not always choose to stay where it is put, and further invention easily produced the numberless brood of clamps and their adjuncts, until the

problem of dryness was fully solved, and one of the greatest difficulties of careful filling absolutely abolished. From the first suggestion of cohesive filling, the more daring minds had conceived of operations never before imagined; and with each added facility the ideal grew more and more exacting. Of course, new tools were requisite to perform these new operations, and the burring-engine inevitably followed. But the engine, invented to do what had been previously conceived, presently enlarged, without limit, the conception of what might be done. It now became possible to do to a tooth, within practicable limits of time and labor, anything of a mechanical nature which the operator might desire; and as the engine put the form and substance of the tooth wholly within the dentist's power, so the whole range of malleting inventions—from blows that would nail a box to the vibrations of the electric mallet—made it possible to give any conceivable bulk and shape to fillings.

Now, all this is a bare outline of only a single course among others along which dentistry has been developing. If one proceeds to fill in this outline with the infinite varieties of filling materials, hand instruments, office furniture and other appliances which group themselves naturally about these salient features, he will begin to grow bewildered. But when all this is done there remain at least two coordinate lines of progress not yet suggested and equally prolific. Quite as full a statement might be made of the evolution of mechanical dentistry which touches at so many points various industrial processes of general application. And again, on the other side of operative dentistry, spreads the vast field of anatomical, physiological and histological research, industriously cultivated through all these years, and fruitful of results which may, indeed, seem remote from our daily work, but which some new pathological condition may, at any moment, thrust imperatively before one's face as the one thing he needs now to know. But even when these three strands are twisted into a single conception, the whole is not stated. For this process of advance

rolls forward with unceasing increase. Every capital discovery comes to us pregnant with an unimaginable brood of auxiliary novelties, and so far are our present attainments from completeness that each of them seems an open door into the future, and there is probably no one thing of which all dentists are so sure as that the progress of the dental art has only begun.

THE OUTLOOK.

If we sweep, then, with a comprehensive view, the entire field—past, present, and immediately to come—it will appear no exaggeration to repeat that “the number of things which a practising dentist ought to know threatens to become overwhelming.” And the difficulty is the graver, because this advance goes on by a certain organic force of its own, developing new activity at most unexpected points, and remaining stagnant for long periods just where we most desire improvement.

No man can say or guess what theory of his will be exploded next week, nor what favorite method of practice may have to be dropped, and a new one learned instead. It is all we can do to hold our ground and yet, at any moment, the bugle may sound an advance. For a conscientious man all this is no small perplexity, and he may well ask himself and his neighbors what must be done.

Fortunately, we are not the first among men to meet the same trouble, and the way of escape, while it is not easy, is well known. The growing intelligence of mankind, since the dawn of the twelfth century, and especially for the last four hundred years, has been beset by a swelling flood of individual facts in all departments of knowledge, and has had, in respect to the entire field of human observation and action, just that difficulty of retaining and using its acquisitions which now besets the narrower area of the dental profession. And mankind long ago found the solution of the problem which is called Science. The urgent need of dentistry at this day is, that it become, not so much a separate science, for it is too composite for that,

but through and through, and in all its details, scientific. For science is like the fairy tent in the Eastern tale, which could be held at need in the palm of one's hand, and yet expanded in another moment to shelter an army. Science may, this morning, be focalized upon the slender margin of a proximal filling, and this afternoon formulate the universe.

WHAT IS SCIENCE?

Now, what is science? Many persons, who ought to know better, imagine that a man of science is one who knows more or less facts generally unknown, and can state strange theories about them; so that remoteness from the observations and conclusions of average life, becomes the central idea of science. How absurd this idea is need not be argued before this assembly; and yet even those who are doing honest scientific work do not always know what constitutes a valid claim to the honor of that name. Etymologically, science means, and has meant, these five and twenty centuries, *knowledge*. But, in the language of the nineteenth century, *science is the knowledge of things in their relations to each other*. And this recognition of the supreme importance of *relation* in the knowledge of facts is the distinctive mark of all science. The mechanic, the miner, the savage hunter, can teach the physicist, the geologist, and the naturalist, separate facts which the learned never knew. But to the empirical minds of the former each fact stands by itself—curious or useful, but alone; while the man of science immediately fits, or strives to fit, each separate fact into some gap where other facts had not seemed completely adjusted to each other; and the result is often like adding the keystone to the arch—it is only one stone more, but it makes efficient all the rest. Precisely the same consideration, turned the other way, corrects the pernicious fancy that the chief business of science is to spin theories, and mostly from a very slender staple. So untrue is this that the moment any man's theory goes a hair's breadth beyond known facts, science

refuses to be responsible for the conception, and it becomes the individual hypothesis of the inventor, to stand or fall on his responsibility alone. What is actually done, when the wonder-working hand of science ennobles the meanest thing, and brings cosmos out of chaos, is to demonstrate the ascertained relations of ascertained facts, constituting an order which existed equally before it was suspected, and is wholly independent of human invention. There is no more perfect statement of the true meaning of scientific discovery than Kepler's, who, having at last verified the three laws of planetary motion, exclaimed, "O, God, I think thy thoughts after Thee!" And this idea, which is so sublime in its larger applications, abates nothing of its severity when it is applied to the smallest and most familiar things. In the contour of a bicuspid, as in the movements of the heavens, that, and that alone, is scientific which expresses the actual relation of actual facts.

It is by thus *sorting* our facts that science removes the vast difficulty of remembering or recalling the numberless integers of human knowledge. That fundamental law of memory, association of ideas, enables the mind to pass from point to point along and across the endless web, and having what is before the eyes, to recall whatever of the kind has been previously seen. By this means alone, the human mind is capable of the knowledge it already possesses, and looks forward, without dismay, to the sure increase of the future. And it must be by this means alone that dentistry will keep at its free disposal all the past has yielded, and be glad to give hospitable welcome to all that is yet to come.

ACCURACY.

From this point one may diverge into many profitable trains of thought. It is the object of this paper to follow only one of them, by insisting upon that habit which is at the core of all scientific advance, and which, the writer makes bold to say, is to-day the one most striking deficient in the mental processes of dentists—accuracy. In this

connection, accuracy means simply keeping close to the facts, whether they be facts of being or facts of relation; and all that has been said shows the supreme importance of that posture. The scientific knowledge of the universe is like a Waltham watch, a complicated fabric of many parts, each constructed by a different man in a different room. The parts being done, the watch is done, on the one condition that each part is exactly right. If this is so, all will go smoothly together and keep perfect time; but if any one workman has made his piece a trace larger or smaller than the gauge, the piece will not fit and the watch will not run. So if any man reports, under the name of science, a fact a hair's breadth wider or narrower than the gauge of exact truth, it will frustrate some other man's observation and throw the whole group to which it belongs into confusion. But it is the characteristic of truth, exact truth, that it "fits all around." So that a fact accurately reported a thousand years ago will tally exactly with its correlative fact discovered yesterday.

With these preliminary generalities let us now consider more in detail several ways in which our art demands more scientific accuracy than it has habitually found in its votaries. But here let me disclaim the attitude of one who passes judgment on the fault of others. The difficulty of maintaining always that accuracy which is the vital breath of science is so great, that no man need hesitate to own he has many times failed in the endeavor. Certainly the writer owns it freely, for the faults which are to be criticised are best known to him from the efforts he has made—not always with success—to avoid them.

KNOW THYSELF.

The first demand for accuracy which the dentist is bound to recognize, relates to his own estimate of himself. When the Rev. Jasper stoutly asserts, "The sun do move," and preaches sermons to demonstrate that it is on the east side of the barn when it comes up and on the west side when it goes down, that dusky divine is beyond question

perfectly honest, and his chain of evidence seems to him complete and unanswerable. His mistake simply is that he supposes himself fit to judge of things for which, in fact, he has no capacity. He neither knows the amply demonstrated facts which prove the rotation of the earth, nor has he the mental training necessary to understand the cogency of their meaning if the facts were laid before him. The difference is that most Americans are intelligent enough to know their own position in such matters, and do not presume to question the consenting testimony of all those who are competent to judge. To this modest and correct self-estimate Mr. Jasper is the exception. Now, among dentists the Jaspers are uncommonly many. We are generally a self-satisfied and willful class, and each of us is apt to think he has seen all the human mouth has to show and is a little better qualified to judge of it than anybody else. While the fact is, as every educated man among us will confess, there are but few (besides himself) who can impartially observe, carefully generalize, verify by satisfactory experiment, and so add to the accurately ascertained science of our art. Perhaps this misconception was at first unavoidable. When the appeal was made to dentists to study their facts and lay a scientific basis for dentistry, it was natural the apostles of science should declare no man was fit to practice who was not a scientific man. And if this was the word, then multitudes of dentists who had honestly plodded along before and done much good, mixed with some unmeant harm to mankind, must decide whether to own themselves unfit for the work which fed them or to become "scientific." Of course they decided upon the latter. It was rather interesting and not too laborious to read a few books and remember the long words, to look over some plates and peep into a microscope now and then, and presently to select some one of those thousand fancies which swarm in all dentists' heads and vent it decked with learned terms as a guarantee of scientific standing. The hands, indeed, seemed the hands of science, but the voice was the voice of Jasper.

The root of the whole mischief lies in one ambiguity. Dentistry is an art, and is striving to become a science. And every dentist is bound to sympathize with this endeavor, to keep himself informed of all progress that may be truly made in it, and, *if he be competent*, to help it on. But it does not at all follow that a man's practice is worthless and he a charlatan because he cannot give scientific account of what he does. There is many a man whom I would gladly have fill a proximal cavity in my molar, but for whose opinion upon the electro-chemical theory of decay I do not care a fig. And it would be infinitely more dignified and honest for such a man to listen quietly, doing what he has found good until something better is shown him, than to rush into speech or print with his crude and worthless opinions. They encumber the field and bring the discussion into contempt. But the manipulations of the dental art, honestly performed according to the operator's experience or that of his teacher, while they may be called old fashioned, will do service to his patient and win honor for himself, though he should declare himself continually a learner and not a teacher of science.

LEARNING AND TEACHING.

But supposing this selection to be somewhat fairly made, there remains much need to urge accuracy upon those who are qualified to push the car of *Science*. And for these the subject may be divided into two branches accuracy in learning and accuracy in teaching; the former covering the process by which the investigator ascertains scientific truth—the mental endosmosis, and the latter that by which he conveys to other minds the knowledge he has acquired—the mental exosmosis.

The process of acquiring scientific knowledge at first hand, consists of three parts, the observation of facts in nature, the deduction of a generalization from a series of related facts, and the verifying of this generalization by suitably contrived experiments. The student of dental science has peculiar advantages in pursuing this process,

because the successive steps are, in his field of observation, easily distinguished. Let us take each step in order.

Observation. It is one of the popular fallacies that nothing is easier than to see what is before one's eyes. But the fact is there is nothing more difficult. Hardly a suit is tried at law in which eye-witnesses of equal credibility do not contradict each other concerning simple facts. There is probably not a dentist in this assembly who could at this moment describe the conformation, tooth by tooth, of the full human denture, without making blunders which a dozen others would immediately detect. And yet each of the dozen in his turn would make other blunders equally great. It will be a wholesome lesson to any who may doubt this, to try the experiment of studying his watch-case or his pen-knife five minutes, and then attempting to write an accurate description. Now, it is just this *accurate* account which science needs. Give this, and it will fit any other observation or any continent. But the untrained mind imposes upon the mental impression which an object makes, such distortions as its prevailing habit of thought or its present mood or passion happens to dictate, and the untrue result passes into memory as an actual presentation of the object. But this is not scientific observation. On the contrary, it is necessary that the scientific observer be on his guard against these delusions; and even with long practice he will hardly acquire such a habit of seeing simply what is before his eyes as will relieve him of the duty of cross-examining his perceptions while the facts are still in sight.

It can hardly be necessary to insist much upon the statement that the annals of dental observation are vitiated most broadly by this unpardonable fault. How else are we to take those frequent marvels which are gravely related as common in this or that gentleman's practice, but which nobody else ever sees? It is impossible to imagine that dentists lie, but it is certain they squint terribly. Let me again repeat that the difficulty is enormous of eliminating from our simplest observation that which others have re-

ported, that which we hoped to find, that which our dyspepsia or our weariness or our vanity suggests, and seeing merely that which we see. Let no man feel offended at the suggestion that he needs this purging of the eyes, or ashamed to confess that he finds it extremely hard to achieve. Accurate observation of separate facts is the corner-stone of science, and only master masons can lay it.

Generalization. The mind is constructed with an irrepressible tendency to generalize. Two facts can hardly be observed in succession without a perception of some likeness or unlikeness, and as the series extends the comparison grows into general ideas. In fact the mind does this work extensively and with much correctness without our conscious effort. Men who never deliberately deduced a principle from a series of facts, nevertheless have general ideas by which they guide their conduct and to a degree predict the future. Probably a close scrutiny would show that all minds necessarily depend much upon the results of such unconscious cerebration. But while the process is largely unconscious, it is still governed by these habits of mental action which we have full power to train and cultivate. He who takes care to think closely when he is purposely thinking, will find his mind has done its spontaneous work in an equally accurate manner. While he who permits his desire or his sloth to vitiate his deliberate thought, will find his mind slovenly and untrusty when it works of itself.

Now, by this process of generalizing, the mind, having observed a certain thing in a certain relation again and again, relieves itself of the burden of remembering each instance separately by formulating the whole—A implies B. A swelling under the gum and certain reports of pain make the dentist as sure of an alveolar abscess as if he had extracted the tooth and seen the sac. The first imply the second. And this process of distilling the active principle from a series of facts, is the precise and constant function of science. It is the knowledge of things in their relations. Here, therefore, is the utmost need of accuracy. But here,

also, is the utmost danger. The process is so fascinating that it is especially hard to keep the mind in suspense when a few data tempt it to assume rest in a general statement. All sciences, from chemistry to theology, are loaded down with these hasty conclusions of former times. And a great part of the business of scientific thinkers at this day is to test anew accepted principles and eliminate venerable errors.

NIMBLE-MINDED DENTISTS.

Of course a set of men so nimble-minded as dentists, have not been backward in this charming pursuit. No part of our history, and least of all the present, has lacked abundant instances of inaccurate generalization. Sometimes the error has lain in the faulty observation of facts, so that one may say the theory would be correct if the facts were only as they have been understood. But this goes back to the first step in the process of scientific investigation; and of that enough has been said. The inaccuracy peculiar to the process of generalizing is the deduction of general statements from too few observations. If some dentist to the Bourbon family should declare the protruding lower jaw a normal conformation, because many of his best patients had it, he would be settling the standard of fourteen hundred million people from a dozen observations; but he would be little more hasty or inaccurate than many dental theorizers have been. Three faulty deductions, current in three epochs of dental practice will make clear the nature of this error and the need of making sure the basis of our general statements.

Long ago this maxim was somewhat current: "A tooth which has ached cannot be saved." We smile at that now, and probably it was never held in its full meaning. But it was honestly meant as the summary of many fruitless attempts to manage exposed and inflamed pulps, mostly ending in disaster. The disappointed dentist might naturally conclude to ignore the rare exceptions and extract aching teeth. The error obviously lay in assuming that the limited resources of that day covered the whole possible

ground ; and the vice of this assumption readily appears if we consider on the one hand the very narrow limits of dental manipulation and dental medicine at the time, and on the other the large results which have gradually come from disbelieving this rule and trying for better ways.

Far more recently another maxim has had many advocates : "Any tooth that is worth filling can be saved with gold." If the New Departure has done nothing else, I fancy it has killed that idea. But most dentists who have had experience enough to know the value of a tooth, have been gradually coming of late years to care less what a tooth is filled with and more for the result. To my mind it seems clear that these worshipers of gold really meant, if they had said their exact meaning, that no tooth is worth filling which gold will not save. Their error, therefore, lay in excluding from their view all teeth but a single group, and from the latter drawing a principle for universal application. Many a well eaten dinner to-day will give, against their narrowness, the testimony of despised but useful grinders which gold could not have saved.

THE NEW DEPARTURE.

My third instance of hasty generalization is as novel and noisy as a new-born babe. It is the first article in the creed of the New Departure : "In proportion as teeth need saving, gold is the worst material." Since this startling law was announced I fancy many hundred dentists, as they made the customary examination of mouths long under their charge, have wondered on what evidence the statement rests, and pondered over those mystic vials in Philadelphia. I remember a central upper incisor which split from side to side, throwing off the entire face from the groove on the cutting edge to a point far under the gum, and laying open the empty pulp-chamber. The mouth was well filled with good teeth, and it seemed as if the need of saving that tooth was of the largest proportion. It was nothing wonderful to replace the lost half with gold, nor was I surprised to find it lately in perfect condition, after six years' service ; but

considering the great need this tooth had of filling, I was puzzled to understand why gold was the worst material that could have been used. And we should stay here a week if every dentist present gave the many cases of equal plainness which he can recall. Confronted with these every-day facts, the Departing brethren would doubtless say they did not mean these, and on cross-examination it might probably come out that their minds were chiefly fixed on the *cervical* borders of proximal fillings in bicuspid and molars. To which injured and hindered Science would reproachfully answer, "Then why did you not say so?" It can hardly be doubted that the daily experience of the profession will soon make plain that this latest novelty in generalization is the fruit of minds which have so much concentrated their gaze on certain facts, as to forget all others and make the part equal to the whole. It may seem that too much space has been given to this topic. But no space can be too great if it impresses upon our minds the exceeding difficulty and importance of accuracy in drawing general ideas from individual observations. And I will take the liberty of suggesting to our teachers that they should *incubate* long and patiently over their facts before they presume to announce what manner of fowl they have hatched. Meanwhile, nothing will be more useful or more scientific than a constant familiarity with certain qualifying words and phrases:—"Probably," "In my opinion," "So far as is known."

Verification by experiment, is the final step. And here the branch of operative dentistry has all the advantages of an applied science dealing with familiar things. When Columbus had inferred the rotundity of the earth, it took him many years of toil and delay before he could try the experiment of sailing westward. When Ericsson had deduced the idea of the screw propeller, it required governmental aid, which was not easily obtained, to test the invention on a satisfactory scale. But when the operative dentist has slowly worked out a new idea relating to his art, he may confidently expect within a week or two the chance of

putting it to the test. Every trial of a new material or a new instrument, every new shaping of a tooth or a cavity, every new medicine laid on a pulp or injected into an abscess, is, in the best and scientific sense of the word, an experiment, provided only it be made not at hap-hazard, but with a definite theory to test, and an intelligent choice of cases. Add to these the experiments of the laboratory, which are so happily becoming frequent among us, and the observations of the microscope and the scalpel, and it cannot be said that dentists are neglecting this crowning portion of scientific research.

But it must be said that while much of this is done daily, and while dentistry is making much sure progress by these means, still we are beset by theorizers so ignorant of scientific methods that they suppose the whole process to be complete when they have looked at facts and spun from them a more or less careful theory. Then the noise begins, and the wonderful discoveries are announced which startle us to-day and amuse us to-morrow. Let us all remember that science holds to facts at both ends. Her work begins with observing them as nature presents them, and ends with submitting to their inexorable decision under experiment whatever she has inferred. So that there is not and there never can be a single theory or general statement of anything in the universe which is a part of true science, except those which have been fully verified by the test of experiment. All besides is opinion or conjecture, more or less useful and often the best we can attain for the present, but wanting something still to make it scientific truth. But he who has patiently gone through this process, has accurately observed, accurately generalized and accurately verified, has enlarged the boundaries of human knowledge, and has claim to the respect and honor of mankind, whether the object of his research be the axis-cylinder of nerves or the order of the heavens.

KNOWING AND TELLING.

It remains to consider the converse process of making known to others that truth which has been gained in this

laborious way. The two faculties do not necessarily go together. Because a man has learned, it does not follow that he can teach. On the contrary, the writer has known a maker of artificial dentures whose skill in all the details of constructing and adapting his work was simply marvelous, the admiration of all beholders. In his laboratory every tool was exactly right, and every process strictly methodical, while his results were always of the highest quality. And yet this man was wholly unable to describe his methods. In the attempt he would omit essential details, and at last break down in failure, saying, "I can show you, but I cannot tell." Now, the interests of science require that such a man should be silent. It is no impeachment of his one excellence that he has not a certain other excellence; but it is a grave fault if because he can *do* he therefore claims an undeserved privilege of *saying*. His words will be inaccurate, and his half-told truth will have the effect of a lie. But what a few do from a fault of natural capacity, many do from negligence. Part of a process is told with the unconscious assumption that the hearer will supply what is not told, whereas, the hearer has no hint that anything is left to be supplied. Cases are stated without mention of surrounding conditions, although these conditions are essential to a just conclusion. But there is no need to multiply applications. It is among the commonest experiences of those who look into new dental discoveries or methods, that when they see the *thing* the first glance shows some essential deficiency in the description. "You didn't mention that," says the spectator. "Why, I thought anybody would understand that; of course," answers the would-be teacher. A notable instance of this is recorded in the published minutes of this body for a year not very remote. A gentleman read a paper describing his method of treating exposed pulps. He was understood to claim that by this method he saved almost a hundred per cent. of all cases which came to him. Such a claim, of course, called forth a brisk fire of cross-examination, which at least drew out the fact that the writer only

attempted such cases as he judged would do well, and *of these* he saved the large percentage named. So that the gentleman's paper demonstrated, not the success of his method, but the shrewdness of his judgment. These and a hundred other instances present the common characteristic of confused mental conception as the cause of inaccurate teaching; and the remedy is to be found in mental discipline.

OUR VOCABULARY.

But there is a second cause which obscures literature, and which is less excusable. Some of our instructors who seem to know well enough what they want to say, fill their teachings with unusual or even unknown words. Having constructed a theory to express, they next construct a language to express it in; forgetting, however, to furnish the hearer a dictionary of the new tongue. It is of course true that the necessities of *science* call for many new words, partly because new things are to be named, and partly because an accuracy of expression is needed, which is not easily attained with common words. But much of this is already done, and the results are at our service, so that it is a positive fault to distort the statement of important facts by the use of obscure and uncouth substitutes for accepted words. If the gentlemen who find themselves subject to this temptation would study the dictionary, they would probably be surprised to find how amply the English language is already provided for all occasions, and their hearers would certainly be delighted at finding themselves able to understand every word the teachers say.

Finally, to sum up this extended paper in few words, we dentists are confronted with a multitude of things already known and another multitude, which no man can number, of things pressing to discovery. The only possibility of having all these at our command lies in knowing them *in their relations*, which is science. And the fundamental requirement for obtaining such scientific possession is *accuracy*,—accuracy of eye and touch, accuracy of perception and memory, accuracy of comparison and induction, accuracy of

test and accuracy of speech, in a word such accuracy of the whole observing man as may be worthy to set itself beside that infinite accuracy of fact which we call the Laws of Nature.—*Odontographic Journal*.

ARTICLE III.

CHEMISTRY.

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(Read before Virginia State Dental Association, at Natural Bridge,
August 10th, 1886.)

I do not like apologies for papers, they generally imply that the author could do better under different circumstances, and often the inference is unjust.

But really, gentlemen, I, with my colleagues on your committee, have unfortunate subjects. You know that each and every one of you prepared yourselves to be bored, as soon as you saw me take my stand to talk on chemistry. We do not come to these Associations to be teased with long, tedious papers on abstruse subjects. We want something practical, something with a point and straight to the point.

It is not easy to prepare such an essay on chemistry, but the subject is not my choice. It was imposed upon me by our worthy President, with the reminder that it was customary to "pass the subject," and the hope that I would see that such was not the case in the present instance. Unfortunately, few dentists profess to know anything of chemistry—still fewer *do* know anything of it. Each year I am asked the question by students, "Why need we pay so much attention to chemistry, a study which we will have no use for in practice?" The history of chemistry itself would furnish an answer to the question. In olden times,

the chemist of the day spent long and weary hours, and often sacrificed his life in experiments, the chief end and aim of which is set forth in the three following articles of their faith :

First.—“ There exists a preparation, solid in form and red of color, called the philosopher’s stone, the grand elixir, (major magisterium) the red tincture of which, when it is placed in very small quantities on melted liquid silver, mercury, lead or other common metal, causes a transmutation of the same into gold.”

Second.—“ The same preparation, used in very small doses as a medicine, cures all diseases, rejuvenates the old and prolongs life ; wherefore it is called the panacea of life, and, since it contains the essence of gold, *aurum potable*.”

Third.—“ There is another preparation of a white color, called the stone of the second degree, the little elixir, *minor magisterium*, the white tincture, which is equal to the first in half a degree of perfection, and changes the common metals into silver.”

These things were myths—the dream of the alchemist was never realized, but the discoveries made in the course of their labors founded one of the most valuable sciences.

And so with us, even though we can get along without an intimate knowledge of chemistry, were we more familiar with it, might we not bend many of its principles to our service? Doubtless our friend, Dr. Starr, can best tell us how difficult it has been to introduce electrical apparatus among dentists, to a great extent because of their ignorance of sufficient chemistry to understand the working of batteries, etc. How many new combinations might not chemical research discover to us ; how many oral mysteries would be cleared up, and how much oftener would we practice intelligently rather than experimentally, did we but know more about the methods of analyzing the fluids of the mouth. I said that a paper to be read before a society should contain practical points ; perhaps some one thinks I have so far introduced none, but if I may have induced

anyone to take more interest in the fascinating study of chemistry, I shall consider that I have at least made one point.

I wish now to take up a special branch of chemistry, metallurgy, and under this head to call attention particularly to some things concerning amalgams.

Of course, strictly speaking, only the *analytical composition* of amalgams would come within my sphere, but I cannot refrain from saying a few words concerning its use. The lamented Dr. Webb has said, "Gold, *properly used*, is the *best* known material for the permanent preservation of the teeth." With this statement I thoroughly agree. He further says: "A cavity that can be satisfactorily filled with anything, is worth filling with gold." Granted—and yet, although I hold it as a rule, with very few if any exceptions, that gold *can* be inserted *perfectly anywhere*. I say further that there are times and places when it is the part of wisdom to use amalgam.

The first indication for its use which I would mention is the cheapness with which it may be manipulated. This may seem a sordid motive, but there are patients who would willingly pay the prices asked for amalgam, and thereby save their teeth indefinitely, who would be frightened, if not out of their wits, certainly out of our chairs, at the mere mention of the *necessary* charge for gold, and while those who practice dentistry for fun may do it, yet those who practice for a living cannot, in justice to themselves, spend hours upon troublesome operations without being suitably compensated, which means compensated beyond the ability of many of our patients. Again, we find patients physically so weak that it would be a species of unjustifiable persecution to subject them to so great a tax upon their nervous system as extensive contouring with gold demands.

And a third reason—it may be *possible* to insert gold perfectly anywhere, yet not *everybody* can do it. Repeated failures in certain classes of cases should have taught some men that they are *not* of the number who can; these men can be *honest* by using amalgam, but not otherwise.

There may be some men who *can* put gold anywhere perfectly, but even the best fail sometimes, even we Virginia dentists have been known to fail "semi-occasionally," and these failures occur so much more frequently in posterior-approximate cavities of molars that it will often become a question as to whether the chances are not in favor of a safer operation being done in these positions with amalgam than with gold. Now, what are the objections to amalgams? First, they are of an objectionable color, and become still more unsightly with age, from being discolored by the fluids of the mouth. Next, almost all of the makes on the market shrink, even though we may occasionally get an amalgam which seems to stand the shrinkage test perfectly. I still say we cannot trust to amalgam for a perfect filling, because so many things influence the behavior of alloys that the same formula may give different results at different times because of some difference in the process of melting, some undetected impurity in the metals used, or even difference in the age of the alloy. From the foregoing remarks we can see what are the points to be sought after in amalgams, viz., after the necessary strength is obtained, we wish to obtain an amalgam which will not shrink and which will longest retain a good color in the mouth. These results can only be secured by experiment, for so singular, and oftentimes so unexpectedly different from the character of the ingredients, are the characteristics of the resulting alloy, that no reliable rules can be based on the characteristics of the metals which it is proposed to use. A striking example of this fact is seen in alloying gold, a metal too soft to use pure for many purposes, with platinum, a metal softer even than gold and more pliable, the resulting compound is hard and very elastic. Neither gold nor platinum is soluble in anything but nitro-muriatic acid, but an alloy of these metals is readily soluble in nitric acid. Amalgam hardens by crystallization, or the arrangement of its particles into distinct geometrical figures, in this process some combinations will expand, others shrink, hence an alloy should have its

constituent metals combined in such proportions that the various metals will so counter-balance each other as to prevent either shrinkage or expansion of its compounds. The bulk of all amalgams consists of about equal parts of silver and tin—the differences in amalgams are due to slight variations in the above mentioned proportions of silver and tin and to the addition of small per cents of various other metals. In proportion as the silver is in excess is the alloy more difficult to amalgamate, requiring more mercury and more time for mixing, the more rapidly does it set, and the harder it is after setting, it discolours more readily and the shrinkage is less, and vice versa, when the tin is in excess, our alloy amalgamates more readily, sets more slowly, is softer after having set, discolours less readily, but shrinks more.

Of all the metals which are added to alloy, none exert a more beneficial effect than zinc. From five to seven per cent. of this metal almost entirely controls the shrinkage of the silver and tin, while the more zinc we add the better will our alloy resist the action of discolouring agents. An excess, however, causes expansion. Unfortunately, however, our alloy as it now stands—silver, tin, zinc—is not sufficiently hard to withstand mastication; the zinc, in fact, although improving it as far as shrinkage and color are concerned, tends rather to deteriorate the compound, as far as strength is concerned.

It has been claimed that amalgams containing zinc would frequently cause pains in the tooth, and this trouble was laid upon the back of that dentists' scape-goat, galvanic action. Just here, let me say that the theory of galvanic action between the metals of fillings, is something in which I have very little faith, so little that I do not permit it to influence my practice in the least. I have only seen a *very few* instances of trouble after metal fillings, which could not be accounted for in a more reasonable way, and these cases were so obscure that I am not, by any means, sure that galvanic action explained the trouble.

I think that such troubles are always due to the thermal shocks which are so readily transmitted through any metallic filling, or else to the irritating effect which any metal sometimes seems to exert when applied to freshly cut surface of dentine, especially in very young and sensitive teeth; and the trouble can therefore be avoided by using a liberal layer of gutta-percha under the amalgam, or else by filling the entire cavity with gutta-percha, temporarily. But to return to our alloy. We left it with a body of silver and tin, with sufficient zinc to control shrinkage and improve color, but lacking in strength. Now this element can be given by two metals, each of which, however, has its disadvantage. First, I mention copper: this improves the strength wonderfully, an addition of two to five per cent. making a very hard amalgam; it increases the facility with which the alloy amalgamates, and when amalgamated the mass has a most soft, plastic feeling under the finger, and the grain is very dense; but alas, it greatly deteriorates it, as far as color is concerned, causing it to turn dark, and if much is used, quite black, in a comparatively short time. Gold is the other metal: it tends to harden our amalgam; though not quite to the same extent as copper. It, however, has little or no effect upon the shrinkage. It is no recommendation to an amalgam to call it a "Gold and Platina alloy." I do not mean to speak against such preparations; some of them are fairly good; but they are not so because they contain gold and platina, for gold exerts little effect, except to slightly harden our amalgam, and, possibly, slightly to facilitate amalgamation, while platinum has little effect. I have mentioned the metals which are chiefly employed to advantage in amalgams. Many others are used, but they are of little, if any, practical value; their chief use being to make one alloy different from another, or as a handle for advertising. Even though we may get an alloy *capable* of giving fine results, we can greatly alter its behavior by our own treatment of it. Mercury is often impure because containing other metals. If we are not careful to have a refined

mercury, we may change the whole nature of our alloy by introducing this new metal. The re-distilled mercury of the S. S. White Dental Manufacturing Company, is practically pure, and those who cannot obtain this, can sufficiently refine commercial mercury by agitating it in hydro-chloric acid, or nitric acid—one part acid to two or three parts of water.

Now; in preparing our amalgam, it is very important to secure the right proportions of mercury and alloy; an excess of mercury left in the amalgam tends to make it soft and porous, and in pressing out an excess we are apt to deteriorate the amalgam. This is doubtless due to the fact that mercury, having greater affinities for some metals than for others, brings away with it some portions of some of the metals; thus altering the proportion which had been found to give the best results. All amalgams have the surfaces of their particles more or less oxydized by exposure. For this reason it is best that it should be kept in a tightly stoppered vial. This oxide, incorporated in the amalgamated mass, is a decided disadvantage, besides rendering the alloy difficult to mix with the mercury. A few drops of diluted sulphuric acid poured upon the amalgam, while working it, will take away the oxide and cause the alloy to amalgamate with remarkable rapidity. After using the acid, the amalgam should be washed in aqua ammonia, or a solution of bicarbonate of soda, to remove all traces of the acid. Alcohol answers a very good purpose for washing amalgam, but is not so effective as the process above mentioned.—*Southern Dental Journal*.

ARTICLE IV.

KAVA, KAWA, KAVA-KAVA—A POWERFUL ANÆSTHETIC AND SPINAL DEPRESSANT.

Since the advent of cocaine in its several forms for use as an anæsthetic, the medical world has redoubled its efforts

to find its equivalent, or better, its superior, and would seem to have met with encouragement, if not success, in the person of Dr. L. Lewin, of Berlin. We condense from the *Therapeutic Gazette* two of the leading contributions that have already appeared in regard to the substance and its effects on the system:

Kawa (Kawa-Kawa, Yakona, Yangona) is the root of *Piper methysticum*, a shrub three yards high, growing in Polynesia. The shrub is especially found on the New Hebrides, the Sandwich, Feejee, and Samoa Islands. The kawa-drinks reigned here until the introduction of alcohol, but to-day kawa is a favored drink in Polynesia, where kawa-houses exist like our cafes. Special men and women are selected to chew the root, then it is placed in vessels, water added, and stirred with the hands. The firm masses are then dissolved, and the kawa-drink is ready for use. The drink is served under prayers in half cocoa shells, and appears as a grayish dirty-looking fluid. The assumption that during the process of preparation a fermentation takes place is erroneous.

Chemically the root contains forty-nine per cent. of starch, numerous salts, and a non-nitrogenous body called kawahin. Lewin also found yangonin. Both these elements, however, have been proved to be inert. The actual active principle is a resinous mass of a fatty, aromatic taste, pungent and hot like pepper.

Local Action.—Kawa-resin increases the salivary secretion, and produces loss of sensitiveness immediately or shortly after application on all parts of the body. Taken into the mouth, one receives the sensation as if the part were burnt. Applied locally to the pharynx, the part grows anæsthetic even in the most sensitive persons. Gradually the increased salivary secretion and the anæsthesia of the pharynx disappear again. Applied to the conjunctiva of cold and warm-blooded animals, both conjunctiva and cornea lose the power of reaction to even the strongest irritation. The eyeball can be pressed, pinched, and rotated at

will without producing a reaction. If the kawa-resin be injected into the connective tissue of an animal, anæsthesia ensues in the sphere surrounding the point of injection; mechanical and chemical irritation elicit no reflex response. At and surrounding the point of application no inflammatory symptoms appear, but, on the contrary, marked ischæmia.

Constitutional Action.—Ingested, the kawa-drink produces a sensation of comfort, peace and felicity, and never, as in the case of alcohol, desires of altercation or fight. In the mouth a peculiar pleasant sensation of coolness is received, and may last for one or two hours. Consciousness and reason are in no way depressed, as in the case of opium, but the mental facilities are rather heightened. Fatigue and hardships appear easier borne under the influence of the drug. If larger quantities of the kawa-drink are ingested, a state of happy freedom of cares and a dreamy consciousness set in. The limbs grow feeble and powerless; gradually the will loses its control over the motor apparatus, rendering co-ordinate movements impossible. The person soon lies down, and gradually falls asleep, or rather in a condition of somnolency.

Nausea and headache, paresis of the extremities, and a nervous trembling are the usual sequelæ of kawa-ingestion after the somnolency has passed off. The system soon grows accustomed to the drug, and the kawa-habit is readily established.

Animal Experiments.—If kawa is administered to frogs per os or hypodermically, the animals soon grow feeble, the head sinks, and a state of motor incapacity ensues. Though voluntary motion has disappeared, reflex action is still active.

Lewin saw frogs in this condition for nine consecutive days; only the reaction to light and the slow cardiac action still testified to the life of the animals.

A general central paralysis is produced by kawa in a manner that the anterior horns of the gray substance, the

motor ganglia, are first attacked, and later the sensible elements in the posterior horns of the gray substance, and lastly the brain ganglia. In birds, rabbits, cats, we obtain the same physiological effects. At first motion is apparently increased, the animals endeavor to run or fly away; then this desire vanishes, and the animal lies down; temperature, respiration, and pulse fall gradually and simultaneously.

An alcoholic solution applied by the mouth or subcutaneously produces a deep sleep within a few minutes. Part of the kawa-resin is eliminated with the urine. The gastric mucous membrane shows, after death, an ischæmic appearance. These interesting observations clearly demonstrate that in kawa we have to deal with a drug of a most energetic activity, and that its power to produce complete local ischæmia and anæsthesia, reduction of the excitability of the spinal motor apparatus, and besides psychical quiescence, can be unquestionably utilized in therapeutics.

Kawa promises to become almost as valuable, provided it can be readily handled, as cocaine now is.

The resin is a semi-fluid body, with a peculiar aromatic taste, pungent and hot like pepper; when placed upon the tongue there is a momentary burning sensation, with increased salivary secretion, followed by local numbness, which may last for more than an hour. The kawa resin is too irritating to be applied to the human conjunctiva, but Dr. N. A. Randolph thinks that by first instilling cocaine, so as to render the conjunctiva insensitive, kawa might then be used to produce more prolonged anæsthesia. Its use in dental practice also suggests itself, and in the hands of aurists and laryngologists, though the facts that it is insoluble in water and glycerin, and that an alcoholic solution has serious disadvantages, will perhaps somewhat restrict its usefulness. It may also, perhaps, be used in suspension in mucilage.

Still another use for the resin of kawa or kava, is in the treatment of gonorrhœa and acute affections of the urinary passages. The pain on micturition becomes less, the discharged decreases, and cure in many cases resulted in from ten to twenty days.—*Odontographic Journal*.

Editorial, Etc.

ŒSOPHAGOTOMY FOR THE REMOVAL OF AN ARTIFICIAL DENTURE.—The following operation was performed before the students of the Medical and Dental Departments of the University of Maryland, by L. McLane Tiffany, M. D., Professor of Surgery.

On Sunday, November 14th, 1886, George K., (white), aged 32 years, residing in Baltimore county, Md, while at dinner, had the misfortune to partially swallow his artificial teeth, consisting of a rather narrow vulcanite plate for the upper jaw, to which were attached three incisor teeth, one lateral incisor having been lost from the plate. The denture was arrested in its passage downwards, producing intense pain and partially obstructing respiration, while deglutition, even of liquids, was rendered impossible. A physician was summoned, who detected the plate in the upper portion of the œsophagus, but all efforts to remove it or force it into the stomach were futile. Sufficient opium to relieve the pain having been administered, on the following day, Monday, he was brought by his physician to the Infirmary of the University of Maryland, and placed under the care of Dr. L. McLane Tiffany, Professor of Surgery. On the same afternoon, the patient having been etherized, careful attempts to remove the plate were made, but it was so firmly impacted in the upper portion of the œsophagus that all efforts for its removal failed. On Tuesday, in the presence of the medical and dental classes, the patient was again etherized and efforts made to remove the plate through the mouth, but without success.

The patient lying on his back with his face turned to the right, so as to render the tissues of the left side of the neck tense, Prof. Tiffany made an incision about four inches in length through the integument over the depression between the trachea and the sterno-mastoid muscle. The anterior jugular vein was cut and ligated, and the incision extended from oppo-

site the upper border of the thyroid cartilage nearly as low as the sterno-clavicular articulation. The platysma myoides muscle, and the cervical fascia were then divided. The edges of the wound being held apart with retractors, the omo hyoid muscle was drawn outwards, and the sterno-hyoid and sterno-thyroid muscles inwards. The carotid sheath, with the contained vessels, was exposed and carefully drawn outwards, while the thyroid gland was separated as far as necessary and drawn inwards. The larynx and trachea were drawn somewhat forwards, and the finger passed behind where the foreign body could be distinctly felt through the œsophageal wall.

An incision large enough to admit the finger, was then made into the œsophagus, care being taken to avoid the recurrent laryngeal nerve, through which the exact position of the set of teeth was ascertained. Forceps were then introduced and the plate removed intact. The wound after being thoroughly cleansed, was dressed with antiseptic gauze and absorbent cotton, no sutures being employed. On the following Thursday, the patient was walking about his room with a normal temperature and pulse. He was fed by means of a stomach-tube for six days, after which he was able to swallow liquid food with little or no pain, and the external wound had nearly closed.

MOUTH-BREATHING.—“The New York *World* prints an interview with a well-known physician on the pernicious mouth-breathing habit, “Why,” said the doctor, “you can tell one of those mouth-breathers anywhere the moment you see him. From disease of the nose his lips are retracted, his mouth is continually open, his gums recede and his teeth protrude, particularly those in the upper jaw; the flesh that forms the lower part of the nostrils is shrunken, the openings of the nostrils are diminished in size, there are wrinkles at the outer edges of the eyes, and deep lines run from the nostrils to the angles of the mouth. These all give the person an expression of either idiocy, silliness, or suffering.”

It is said that a man can inhale mephitic air through the nose for a certain time in the bottom of a well without harm,

but if he opens his mouth to answer a question or call for help, his lungs are closed and he expires."

If such are the effects of mouth breathing, it would be best to choose the least of two evils and keep the mouth full of tobacco juice.—ED.

A NEW SUBSTANCE.—A new use has been discovered for potatoes. They can be converted into a substance resembling celluloid by peeling them, and after soaking in water, impregnating with eight parts of sulphuric acid, then drying and pressing between sheets of blotting paper. In certain parts of France pipes are made of this substance scarcely distinguishable from meerschaum. By subjecting the mass to great pressure billiard balls can be made of it rivalling ivory in hardness.

Monthly Summary.

PIN-HOLE CAVITIES AND "CARIES INTERNA."—In practice we not uncommonly meet with cases where a very small opening through the enamel is the only external indication of a very large cavity in the dentine, and even when the enamel is apparently not yet broken through, we may find, on cutting into it, a cavity already forming, or at least a considerable softening in the dentine, giving rise to what I think has often been mistaken for "caries interna." We frequently ask ourselves the question: Can the small particles of food which may enter through so minute an opening bring about so extensive a decalcification? Recent observations have rather inclined me to the view that it must, or at least may, be so.

In explanation of the first case, I have seen the same appearance exactly in pulpless teeth, and have produced it artificially. I have a second temporary molar which was exposed for seven months in a fermenting solution. It shows three pin-holes on the grinding surface, one of them extending nearly

to the pulp and undermining the enamel in all directions. Here there was nothing present to produce the effect described, excepting the chemico-parasitic factors.

In explanation of the second case, I have observed that acids may work their way through enamel in sufficient quantity to produce a softening of the underlying dentine, without completely breaking down the enamel, or revealing a cavity to the naked eye or a blunt instrument.

I have specimens in which the dentine is infiltrated with micro-organisms and beginning to dissolve, while the enamel covering is still not completely disintegrated. In all cases of this nature inter-globular spaces naturally play a very great role. In teeth of very inferior structures the dentine is in some places a mere framework, which is quickly softened, even by very weak acids. It must, furthermore, be borne in mind that in mastication food is subjected to considerable pressure, by which it may be forced through the smallest cracks and openings. We have all seen how particles of food may find their way to the very apex of a root canal which we have under treatment, if we allow it to remain open for a day.--*Independent Practitioner*.

PREVENTIVE DENTISTRY.—That we, as a profession, make our living from the results of the negligence of our patrons in not properly caring for their mouths, all must admit. Of a thousand carious cavities filled, nine hundred and ninety-nine might have been prevented from decay; and of the thousands of fillings made, how many of them prevent the loss of the pulp, or the teeth themselves, and really prevent the use of crockery substitutes? Our artificial way of living is largely responsible for these ravages by decay. The chemically prepared groceries, and the fermented fruits and vegetables, transported from long distances and different climates, added to soft, sloppy cooked mixtures of lemons, eggs, milk and sugar, enter now largely into our daily diet; the tendency being all the time towards preparing dishes that will melt in the mouth, rather than those that are healthful to the dental organs, and thereby healthful to the body, such as tough meat, hard bread, and simply prepared articles that require physical force in mastication.

tion. The former articles are not insalivated as they pass through the oral cavity; and the secretions that are furnished by the glands and membranes, from all such diet, are really of a chemical nature, which dissolve, not only any food that may be left in the mouth or between the teeth, but the teeth themselves. This food not having any physical resistance, mastication is not necessary, and insalivation not important, and the secretions of the organs of the economy are acrid; added to these unhealthy surroundings, the period of rest or stagnation, if I may so call the interval between meals and during the night, these impure secretions become more erosive by being retained in the warm surroundings, and these mephitic odors and gases, are very perceptible to our associates, although the patients may pride themselves upon being very tidy and cleanly about their mouths. It is only necessary, to convince to the contrary, one who imagines that his mouth is in good hygienic condition, to let him pass a thread or quill tooth-pick between the teeth in unfrequented regions, and to put it to his nose, when he will understand why decay could so readily occur. It is not the perversity of human nature, but the ignorance of the importance of thorough cleanliness, that makes so much work for dentists. A proper, thorough and skillful application of the tooth-brush is practiced by the fewest number. It is really a work of art to cleanse teeth, and the oral cavities, tonsils, fauces, so they will bear a critical examination. The Chinese have a professional, whose duty it is to pick and cleanse the teeth, while caring for the other special organs of the head.

The natives of India in performing the mysteries of their toilet, while brushing the teeth and mouth, run the primitive banyan-root brush down the throat so far and make such retching, hawking and spitting, that the uninitiated would imagine that some terrible calamity had befallen the victim's gastric region. Instruct your patients to brush after meals and before going to bed, with water; and often hot water is required. Use a medium sized brush of medium strength of bristle, with an upward and downward motion from the gums to the edges of the teeth, making the bristles act as so many tooth-picks, forcing and lifting out particles of food. Do not recommend the

frequent use of any dentifrice, for to their excessive use, can be traced nearly all cases of abrasion. Our whole duty is to do our operations the best that circumstances and attending conditions will admit, and then give the patient careful instruction to prevent all further destruction of these most valuable organs; for, if like conditions are allowed to continue, similar destruction will be inevitable. Dentistry, like medicine, should seek to prevent these large mouths full of dentistry, and should prevent decay in the deciduous teeth.

The dentist should instruct the patient in the care of the teeth, and step by step, as the new ones come forward, they should be cleansed, brushed and picked, and cared for, in such a manner that decay would not occur. Then in the ideal future, when we can see our patients with a sound mind, in a sound physique, supported by food masticated with sound teeth, the pinnacle or highest result of dentistry will have been reached.—W. N. MORRISON, in *Archives of Dentistry*.

POWER OF AN OPERATOR OVER A PATIENT UNDER THE INFLUENCE OF NITROUS OXIDE.—I have been using nitrous oxide gas in my practice for a number of years. For the first two or three years I had but indifferent success, especially when called upon to remove the wisdom-teeth or second molars. To insure the mouth being open, I used to employ a rubber gag, sometimes substituting for it a large cork with a string attached. In a majority of cases, when the gag was taken out the jaws closed somewhat and remained rigid; no proper amount of force sufficing to open the mouth until the effect of the gas was nearly spent. I finally declined to administer gas for extracting teeth back of the first molars.

Requiring the extraction of a tooth from my own mouth, I went to a brother dentist and had the gas administered. While taking it and while under its effects I was perfectly conscious; heard every word said, but was powerless to move a muscle. I knew when the inhaler was removed and the forceps taken up and adjusted, but felt no pain. The tooth was broken off, and two more ineffectual efforts were made to extract it. Still there was no pain. At this instant I regained control of myself, retaining a knowledge of all that had transpired.

This experience impressed me with the conviction that if patients heard and understood they could be made to obey. It had been a habit with me to test the condition of my patients during the inhalation of the gas by requesting them to raise the left arm. They usually responded, some continuing to raise and lower the arm until the effect of the gas passed off, seeming to be impressed with the idea that they must do so.

The next occasion I had to administer gas I made the usual examination of the mouth, and, after learning which teeth I was required to remove, I turned abruptly to the patient, and said, "If, while you are under the influence of the gas, you hear me request you to open your mouth, do so. You can if you understand now that it will be necessary," I said nothing about raising his arm, but just as I thought he had inhaled enough gas I said, "Raise your left arm," and was surprised to see that, instead of doing so, he promptly opened his mouth wide. As his breathing indicated that he had enough gas, I dropped the inhaler and extracted the teeth. After he regained consciousness I said, "Did you hear me ask you to raise your arm?" He said, "I heard you tell me something, and as you had charged me to open my mouth if asked to, I thought that was what you wanted."

I have taken advantage of this experience ever since—some three years—and have yet to meet the first failure. After charging a patient to respond by opening the mouth when told to, I proceed to administer the gas, and just before he passes under its influence I say, "Remember and open your mouth when I tell you to." Thus the last thing the patient thinks of is opening his mouth, and almost invariably it is the first thing he does. I have tried the command without previous instruction, and failed to obtain a response. I think this suggestion worthy of investigation by those who use gas.—*W. C. Bunker, Oregon, Ill.*

HYDRONAPHTHOL—A NEW ANTISEPTIC.*—Hydonaphthol is a non-poisonous, non-corrosive antiseptic and disinfectant. It has a slightly perceptible aromatic taste and odor,

* I am indebted to Dr. George R. Fowler, of Brooklyn, for the facts regarding the composition, properties and relative strength of hydonaphthol in comparison with other antiseptics.

and crystallizes in scale-like clino-rhomboid laminae, of a silvery-white or grayish hue, resembling zinc-bronze. It is a derivative of the hydroxyl substitution of naphthalin. Within the last two years it has been discovered that this substance possesses antiseptic properties, and the claim is made that it is from ten to fifteen times more efficient than carbolic acid, being the most promising antiseptic of the phenol series. As an antiseptic, it is about one-fifth as powerful as the mercuric chloride; from one and a half times to double the strength of iodine, and four times as strong as sulphurous acid. Carbolic and salicylic acids follow in the list of antiseptics, and it is thirty times as powerful as the latter.

Hydronaphthol possesses many advantages over carbolic acid, for besides its being non-poisonous and non-corrosive, it is a non-irritant. Its odor is not sufficiently strong to disguise that of putrefaction, as it happens with carbolic acid. It is not decomposed or rendered inert by the products of putrefactive decomposition, and this property renders it invaluable in disinfecting pulpless teeth, besides its being far more stable than carbolic acid, not being volatile at ordinary temperatures.

Hydronaphthol is only soluble in water to the extent of one part in one thousand, but even in this proportion it is a powerful antiseptic, while a solution of one to ten thousand prevents putrefactive decomposition. It is freely soluble in alcohol, ether, benzol, glycerin and the fixed oils.

I have been experimenting with this substance, and have kept a careful record of the treatment of twenty-three cases of pulpless teeth, and the satisfactory results so far obtained prompt me to call the attention of the profession; through the *Dental Cosmos*, to the valuable characteristics of this new antiseptic.

My *modus operandi* is as follows: Dissolve the hydronaphthol in glycerin, and introduce a saturated cotton pellet into the pulp-canal, which has already been prepared in the usual way. One application alone seems to act as a radical specific. All soreness, if there be any, disappears in the course of twenty-four hours, as also all traces of putrefaction. At the second sitting, remove the dressing, syringe with tepid water, and proceed to fill the canal permanently with cotton, saturated

with oxyphosphate and hydronaphthol. This is accomplished by mixing some thin oxyphosphate, to which is added one-fourth the quantity, by bulk, of hydronaphthol.

In cases of chronic alveolar abscess, force the hydronaphtholated glycerin through the point of discharge, using for this purpose Dr. R. W. Starr's exhaust syringe, which is very essential in the proper treatment of alveolar abscesses, and fill the canal as before stated. I have been successful in curing alveolar abscesses of long standing in this manner, and have not had a single case of recurrence.—*Francis Eschauzier, D. D. S., Brooklyn, N. Y.*

A CURIOUS CHRISTMAS BOX.—The relator of the following amusing incident was once visited by a former colleague, who asked how he could give his wife a set of artificial teeth on Christmas Eve without her knowing he was going to do so until the presentation.

The friend assured him that if his wife had but one hollow tooth, he could easily obtain an impression without her knowledge.

Accordingly the lady, who was suffering from toothache was brought by her husband to consult his dentist friend. After examination, the latter told the lady he could relieve her from any further pain, but in order to get the stopping properly prepared, he would be obliged to make a wax impression of the tooth he was to stop.

The lady was alarmed, and thought this would be a very painful operation, but consented to submit when her self-sacrificing husband promised to be experimented on first by way of re-assuring her.

The following day the lady again appeared, alone this time, and requested the dentist to make artificial teeth for her husband, to replace those he had lost. She also wished to know if he could do so without her husband's knowledge, as she particularly wished to give them to him as a present on Christmas Eve.

Just before the festival, the two packets containing the teeth were sent off, that with the lady's teeth was taken through the post to the business office of the husband, while the other was addressed to the lady, at their private residence.

The evening came, and with it the double surprise.

Some days after the husband visited his friend and assured him that he should never as long as he lived forget the amusing and astonishing exchange of presents which had taken place on Christmas Eve.—*Zahntechnische Reform—British Journal of Dental Science.*

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ARTICLE I.

OUR DUTY TO OUR PROFESSION.

BY E. P. BEADLES, D. D. S., DANVILLE, VA.

[Read before the Virginia Dental Association, August, 1886.]

If you were to question me as to why I am practicing dentistry, my first reason, high over all, would be because I love it. Indeed, if this were not the case, I should not have the honor, nor should I deserve the honor, of calling you brethren. I am sure you will agree with me when I say that if I had no love for your profession, but merely entered your ranks for what I could make out of you, I would be utterly unworthy of your notice or recognition. And yet, my friends, we have such men in our profession, men unprincipled to the last degree, men caring nothing for the elevation or success of dentistry, but would, with no hesitation, sacrifice its honor and dignity for the pittance which might be made by so doing. Can any profession succeed or attain to high degree if such men predominate? They pull down as fast as others build up—they work disgrace while a few do honor. These men, with the ignorant and incompetent, have been holding us at the bottom, de-

spite the Herculean efforts of the few educated and truly professional, to raise dentistry to the level to which it truly belongs. But we may thank heaven that a brighter day is dawning—men of culture and high attainments are amongst us, men who study dentistry as a scientific profession, and will eventually place it far beyond the reach of many who have heretofore disgraced it. Any business or profession is just what the men in it choose to make it, and it is a well-known principle that men rarely make a real success of a thing unless they are interested in what they are doing. Can a painter successfully reproduce the picture upon the canvass unless his heart be in the work? Can a sculptor be successful in chiseling out what is truthfully to represent nature unless he is eminently devoted to his work? We answer, No. Then how much more important for a physician or dentist who would successfully treat a diseased part of the human system, where it is especially necessary that he should be sympathetic and kind, adapting himself to all the various temperaments which may come under his hand, that he should be devotedly attached to his work. This is the true key to success, and when we shall be able to fill our ranks with educated men who will love their profession, then indeed will we have a revolution, and dentistry will take its place among the most learned. I might say here that my advice to any young man just beginning would be this: "If your motives are not based upon devotion and high principles, so far as your real success is concerned, or the good you will do your profession, you had better seek something else, for you will never attain to that degree of perfection worthy to be expressed by the word success." We want men who will render themselves ornaments and benefactors. We must be able to look beyond mere personal interests if we make the future of dentistry what many of us wish to see it. We should not wrap ourselves in a cloak of contentment and think that "we are well enough," leaving the real burden to be born by the few devoted ones. We should feel that whatever concerns our profession con-

cerns us, and ever be watchful and jealous of all its interests. Let us be true men, true to ourselves and true to our work. We have a mission to perform—let us not shrink from it. The public is gradually learning to appreciate us and our work, and by making ourselves skillful, with intelligence to back us, our future success as a profession, and as a *scientific* profession, is assured. But to accomplish the end, we must ever be devoted.

Our predecessors have done nobly, as is proven by the enormous strides that have been taken during the last two or three decades. And how has this been accomplished? By hard, unceasing toil, backed by an earnest devotion that never wearied. We have many advantages over these men, though they have done so much. We have good colleges which afford us fine opportunities; improved instruments, new methods of treatment, and it will indeed be our own fault if we do not leave dentistry upon a higher plane than that upon which we found it. Surely this is our duty to our profession. Let us be up and doing. Why should our own Virginia Association be behind any in the land? We have brains here. We have thinkers among us. If we lack anything, it is that self-sacrificing devotion which is so essential to success. But there are some who are far from being deficient even in this respect, as is abundantly proven by the time and thought, and careful fostering spent in the interests of this Association, when there seemed little to encourage its future existence. We honor these men, and our hearts go out in gratitude to them for what they have preserved for us to enjoy, and as they pass into the "sear and yellow leaf," may they look back upon a well-spent life, feeling that their labors and devotion are being appreciated by those who follow them.

As said above, it is our desire to place dentistry upon a level with any of the sciences of the day. This is our work for the future. We owe it to the profession: therefore it becomes our duty. Legislation has stepped in to help us. Many of the charlatans which have heretofore

been as millstones about our necks, will have to step down and out. But we must not rest satisfied here. Our law must be amended so that all, whether graduates or non-graduates, shall be compelled to come before our Examining Board. This will place a check upon the colleges that seem to grind out graduates by patented processes. By all means should our colleges require preliminary examinations from students before allowing them to enter.

We can never succeed so long as we have our profession filled with uncultured, uneducated men, and we must rid ourselves of them; our profession has been abused and maligned long enough on account of such. Heretofore we have been allowing any and everybody who could raise money enough to buy a license and a few instruments, to come in, and welcome, and we, as a profession, have suffered for it. It is our duty that we use every means in our power to keep out such men, certainly, if we value our honor. If the colleges will not help us, we must help ourselves. This subject of education is *the* question for us to consider. The future of dentistry is depending upon it, and every day we delay, matters are becoming worse. It is not possible for us to raise ourselves to a desired standard without education. Our friends of the medical fraternity are unfortunate in this respect also. The time was when a man did not think of studying medicine until he had thoroughly prepared himself by a collegiate course; but now men are graduated M. D.'s who cannot write English, saying nothing of not being able to read a word of the Latin diploma which is given them. Our future depends upon the kind of men we graduate and send out. It may not be a man's fault that he has not been able to obtain an education; but this is no reason why our profession should be imposed upon, and be made to suffer. When we shall send out none but proficient men, then it will be that the public will have a proper appreciation of us and our skill. You cannot expect a man to seek advice from one more ignorant than himself. I repeat, this, and this alone, is what is keep-

ing us down, and will keep us down until we right the wrong. I hope our Board of Examiners will consider a deficiency in a man's English education sufficient grounds upon which to reject. We don't want men who can barely read and write, and the sooner they know it the better. I am in favor of rigidity, even compared with the extreme laxity of the past. In the future we will have fewer men imposing upon the public their circulars proposing to "Extract teeth without pain." "Excellent and durable sets of teeth for six dollars." "Gold fillings guaranteed for one dollar." The intelligent public soon finds out these to be humbugs, and are often inclined to judge us, as a profession, by them. By countenancing such we reduce our profession to a trade, and there is absolutely nothing left to which a true man may attach himself. It is our duty to cultivate a love for science for its own sake, ever delving, that we may add a mite to our store of knowledge, to be used for the benefit of those who entrust themselves to our care, and ever endeavor to develop an intelligent appreciation of the resources of science and art which are used to lessen the ills of humanity. Let us forget self, and by earnest devotion ever push upward our profession, always considering its interests, honor and glory. We should emulate our immediate predecessors, carry on the work they have commenced, and never weary until we shall be prouder still of the achievements of this noble science, never flagging until we shall have placed it so high that *any* may feel proud to be numbered among the intelligent and skillful of its members. We have a future before us, a bright future. Let us look to it. The sun of our success is just below the horizon. Its rays can already be seen. Ere long it will come up in all its glory, and we will feel that the old maxim has proven itself true, that "labor has its reward."

I would say, in conclusion, that my heart is with this Association, and my great desire is to see its membership greatly increase, to see each man with his shoulder to the wheel, never shirking or neglecting a single duty, always

ready to do anything that will forward its interests, thereby promoting the interests of the profession. We have only to lay hold of the opportunities offered us, going forward earnestly, and we shall not know the meaning of the word fail. Love for our work is the one thing needful. If we have this, all else will follow. Pleasure and happiness even is then secured, but without it we are failures. This is our great duty to our profession. In the language of a well-known professor to his graduating class, I would say, "Hold fast to this love, if you would not sink from weariness in your earlier years, or find the fruits of success so much dross in your old age."—*Southern Dental Journal*.

ARTICLE II.

NOTES ON THE DECAY OF HUMAN TEETH.

BY PROF. W. D. MILLER, BERLIN.

Four or five years have now elapsed since what may be called the chemico-parasitic theory of tooth decay came into prominence, and since that time it has been very steadily gaining ground. A very great obstacle in the way of its advancement has been the general lack of information as to the conditions of growth and physiological action of fungi, particularly those of the human mouth. It is, however, to be hoped that the work begun by the Illinois State Dental Society, under the leadership of Dr. Black, will be taken up by other societies, and soon bring about a better understanding upon this most important subject.

It is not my object in this paper to go over the ground which I have pretty thoroughly traversed in other papers, but rather to call attention to some isolated points in the etiology of decay, as well as to a few points where I have not been quite correctly interpreted.

While many of the views regarding dental decay which

I labored to establish two or three years ago are now accepted without reserve, and others have lately been completely confirmed by Drs. Black, Sudduth and others, I am not aware that a single point has been made by anyone which could in any way impair the validity of the conclusions at which I then arrived.

On the Physiological Action of Fungi.—There seems to be not a little misunderstanding, even among those who have given more or less attention to the subject, as to the physiological or chemical action of the fungi of decay, and the opinion is prevalent that during the first stage (decalcification) one fungus is present, but during the second (solution of the softened matrix) another. Arkovy even goes so far as to assume a special organism for *Caries chronica*, another for *Caries acuta*, and a third for *Caries acutissima*, &c.

I have already clearly demonstrated in this journal, that any fungus of the human mouth, whether temporary or permanent, which can affect a fermentation of starch or sugar, may be instrumental in bringing about the first stage of decay; that any which possesses a peptonizing action may, by dissolving the softened dentine, produce the second stage; and that any which possesses both properties (and there are many such in the human mouth) may accomplish the whole process of decay. The micro-organism which produces the decalcification may also produce the solution of the decalcified substance.

I have also shown in these pages that the reaction produced by a given fungus depends, in many cases at least, upon the nature of the culture medium. For example, the comma bacillus which I found in the human mouth liquefies the boiled white of egg (it also liquefies decalcified dentine), with the development of strongly alkaline products and offensive odors; in beef extract sugar solution the reaction is distinctly acid, with no trace of bad smelling products. The reaction of a solution containing a pure culture of a fungus can, in the majority of cases, be made neutral,

alkaline or acid, at will, by varying the relative amounts of albuminous and saccharine substances present in the solution. In a like manner the reaction in a cavity of decay must depend to some, if we may not say to a great extent, upon the relative amounts of nitrogenous and non-nitrogenous materials in the cavity. This fact will explain an appearance frequently to be met with in the oral cavity. We find a tooth badly broken down, the pulp ulcerated or gangrenous, the gum, having grown into the cavity and constantly irritated by the sharp edges of the tooth, likewise inflamed and suppurating. We have here an excess of nitrogenous material, and a putrid, alkaline condition. Instead of a thick layer of softened dentine, we find a thin, black, or dark brown layer of comparatively hard dentine, a condition which has led to the statement that decay of pulpless teeth is essentially different from that of normal teeth.

We need not go far for an explanation. The already softened dentine has been for the most part dissolved, and, owing to the *present* alkaline condition, no farther decalcification can take place. From this condition to one of rapidly advancing decalcification we find every transition.

Decay of Bakers' Teeth.—One of the most convincing features in favor of the chemico-parasitic theory is its ability to account for the most diversified phenomena of decay. A striking proof of this is furnished by an article on the above subject from Prof. Hesse, in the *Deutsche Monatsschrift*.^{*} Hesse finds that bakers suffer to a surprising extent from decay of teeth, affecting principally the labial surfaces. He attributes it to the fact that bakers constantly breathe in flour, which is deposited upon the surfaces of the teeth, where it speedily ferments, after being converted into sugar by the diastase of the saliva. I recorded in this journal an experiment in which a glass tube filled with flour and tied to a tooth in the mouth showed a strong acid reaction in a few hours. Hesse looks upon the rapid decay of bakers'

^{*} A translation of this article will be found in the September number of the *Independent Practitioner*.

teeth as a confirmation of the theory which I have supported.

Caries under Fillings.—In regard to this subject, I have not been quite correctly understood. All bacteria require moisture for their proliferation. The majority of them (the ærobes) require oxygen; a few (the anærobes) grow better without oxygen; some grow equally well with or without (here belong a number which I have met with in the mouth) while very many, if not all, may subsist for a short time on the oxygen contained in the medium in which they are found.

From these facts every one may draw his own conclusions. If softened dentine is left in a cavity it should, in every case, be perfectly sterilized and dried (with warm air) before filling, and the filling must, of course, be water tight. Only under these conditions can we with certainty prevent the softened dentine from farther decay, since the mere exclusion of air is no guarantee against the action of the fungi.

Lime-Salts as Antacids.—The lime-salts of the tooth are usually spoken of as antacid, and therefore are speedily neutralizing the acids of decay. This is only in part right. The carbonite of lime is antacid, but the phosphate, which makes up the great bulk of the lime-salts, is not, *i. e.*, it cannot neutralize the acids of decay. Add as much phosphate of lime to a weak solution of lactic acid as it will dissolve, or even an excess, and it will be found to be as strongly acid as before, and in this condition it still appears to retain the power of softening dentine, though not as rapidly as an equally strong solution to which no phosphate has been added.

A drop of lactic acid applied to dentine does not, therefore, extract that amount of lime-salt which is necessary to neutralize it, but rather that which is required to form a saturated solution of the phosphate after, of course, deducting the amount which has been neutralized by the carbonate. In another paper I will discuss this point more fully, and endeavor to present some interesting facts which grow out of it.

Test for Lactic Acid in Decaying Dentine.—Prepare a mixture of carbolic acid and chloride of iron, as described in previous numbers of this journal (the color must not be too deep). Put about 3 c c., say a large thimbleful, in a test-tube, and carefully add the softened dentine from a decaying tooth; let it stand from ten minutes to two hours in a dark place, and a yellow color will usually appear around the pieces of dentine, indicating lactic, citric, tartaric or malic acid, and in consideration of the fact that lactic acid fermentation has been proved to be constantly going on at certain points in most human mouths, furnishing pretty conclusive proof of the presence of the first mentioned acid in decaying dentine.

This is the same result which I arrived at by the very laborious and difficult process of treating large quantities of decayed dentine with sulphuric acid, extracting with ether and forming the zinc-salt. The amount of acid present in a decaying tooth is not always sufficient to produce the reaction clearly.—*Independent Practitioner.*

ARTICLE III.

THE PERIOD OF PUBERTY AND THE TEETH.

BY DR. DANIEL T. NELSON.

[Retiring President of the Chicago Gynæcological Society, in his address, speaks as follows about the Decay of Teeth at Puberty, Proper Developments of Sexual Organs, Mothers' Food, Tight Lacing, &c.]

There is, I know, a law of compensation, whereby if one organ or system of organs is disabled or over worked, another will try to aid it to do its work, as the skin and alimentary canal when the kidneys are disabled, or the fingers and the ears when the eyes are useless; but these are conditions of disease, not health; of pathology, not physiology.

Tried by this law, then, what are the conditions necessary for the normal development of the reproductive organs? Plainly, the normal development and activity of all the other organs and system of organs, and conversely, the other systems of organs can only attain their highest functional activity when the sexual organs are perfectly developed. During the period of puberty, then, from 10 to 18 years, or more commonly from 12 to 16, do we ordinarily find the girls in our families possessed of an alimentary, glandular and vascular system sufficiently developed and so normally active that a healthy blood, containing in quantity and quality just the pabulum needed, is carried to each tissue? During these years of puberty which we are considering, the teeth begin to break down, in not a few instances, and as a result, digestion is impaired.

But why do the teeth so often decay in girls at puberty and during early married life? Why is it, for example, that the German, Swede and Norwegian girls who come to this country with model teeth and the picture of health, unless we except the light complexion of the Scandinavians as hardly compatible with the most robust health—why is it that these girls live in our families but a few years before their teeth begin to decay, and they lose the fresh bloom of health which they brought from their native land? And then, if they marry and bear two or three children, they are almost a wreck; their teeth are so decayed as to be of no use for mastication. They are poor and feeble, pale and anæmic, old and haggard, but the shadow of their former selves; in the best possible condition to receive and develop almost any form of disease, tuberculosis and the like. Why this change? It is not simply the change in their habits of life and the climate, though these have doubtless had their influence: but I believe a far more important cause will be found in the quality of their food. The quantity of the food they consume is probably greater than what they would get in the old country; but is the quality as appropriate for the nourishment and development of *all* the tissues? I believe

not. For while the carbonaceous and albuminous foods are eaten in greater quantity, the *inorganic* is deficient, and here is an important source of weakness and decay, as I believe. The inorganic portion of the wheat is largely removed in the process of grinding, leaving only the starch and some of the gluten in the white flour which is eaten. While the brown bread from the coarser flour and from rye, which was formerly used largely in this country, and is still in most foreign countries, contained far more of the inorganic substances necessary for the development and nutrition of the bones, the teeth, and other important tissues, and as the result, the teeth erupted earlier, were better formed, and did not decay as readily, the bones were better developed, and all the tissues firmer.

During pregnancy, if the inorganic foods are not furnished the mother in sufficient quantity, the foetus will even take it from the bones, and especially the teeth, of the mother, for all the tissues, the softest as well as the hardest, must have inorganic food, and while these resources of the mother are freely drawn upon, the deficiency may be so great that both the mother and child suffer for the want of them. But it is the rule that the mother will suffer first from the deficiency, her stomach will be disturbed, indigestion, heart-burn, and the like, and her teeth will decay and break away before the tissues of the foetus will seem to suffer. But these symptoms may usually be readily relieved by giving the mother a sufficient quantity of the lime and magnesia salts—in other words, furnishing her with a sufficient quantity of inorganic food.

And the developing tissues of infancy and childhood need more food of all kinds, the inorganic included, than the simply working tissues of adult life. So during puberty the girls need more of this food for the proper development of the reproductive organs, a whole system of organs developing within a few years. To insure, then, a normal development of the sexual organs at puberty, there must be a suitable supply of *all* kinds of food, and not the least, the inorganic.

Among our American girls there is another important cause of imperfect development, and consequently abnormal functional activity of the generative organs, in the *style of dress* now so nearly universal, consisting essentially of the tightly fitting *corset*, with equally tight outer clothing—for even if the corset may seem to be loose when first applied, and they are never acknowledged to be tight by the wearer—yet it must and does prevent the expansion and development of the lungs and muscles of the back and abdomen. It displaces the liver and stomach upward, and presses the abdominal viscera downward upon the pelvis, compressing these organs during the important period of their development, and laying the foundation for the congestions, the pelvic inflammations, the flexions, the displacements, and perhaps even the ovarian and fibroid tumors of later years. Among girls of foreign birth the corset is not generally put on until the changes of puberty are complete, consequently its evil effects are not seen as early, usually not until several years of menstrual life, or even after marriage. But our American girls are not *dressed* without the corset, even *before* puberty, so they have its evil effects during puberty, during menstrual life, and generally during the rest of their lives.

Not only does the corset prevent the development of and displace the important organs of the thorax, abdomen and pelvis, but it, either alone, or with ingeniously contrived additions, is made to compress and prevent the development of the mammary glands, while it seems to enlarge them.

Dr. DeWolf tells us that statistics show that half of all the deaths are children under 5 years of age, and that while 40 per cent. of all the babies born in the United States die in infancy, only 18 per cent. die during the same period in Norway.

The chief reason for this frightful difference in the mortality is doubtless due to the fact that so many more mothers can nurse their children in Norway than in the United States, for I will not believe that there are many

mothers in any country *who will not* nurse their children when they can. Corroborating and explaining these statistics, is the statement that 10,000,000 nursing bottles were made in this country during the last year. How many were exported and how many more imported was not stated. Neither are we told how many *tons* of infant foods were manufactured in the United States and imported during the same period. Surely, all must acknowledge that very many of our American mothers cannot nurse their children, or only for a very short period, and that this is one of the important causes producing this frightful mortality among our children. Have we explained in part the reason for this? If so, the remedy is evident.

But so long as the corset is in favor, the gynæcologist and the undertaker will thrive, and the wet nurse will be in demand.

But other systems are needed to complete the harmony necessary to the perfect development of the reproductive organs at puberty, beside the alimentary, the vascular, and the glandular. The muscular and nervous systems have most important functions to perform. Physiologists estimate that the voluntary muscles normally require from one-third to one-quarter of all the blood for their nutritive and functional activity, and *vice versa*, healthy and active muscles are required for a normal blood, which shall be rich in the pabulum needed for the developing tissues. And here our American girls usually fail as puberty approaches, their muscular exercise is restricted, they are confined within doors, and their time given to music, drawing, painting and receiving friends, instead of the more active pursuits which would continue the development of the muscular system, while it aided alimentation; or perhaps what is worse, their time is devoted largely to study, thus calling into undue activity the nervous centres, and so developing the whole nervous system that this is ever afterward the dominant system.—*Jour. Amer. Med. Asso.*

ARTICLE IV.

A CRITICISM OF THE HERBST METHOD
OF FILLING TEETH,

BY W. W. ALLPORT, CHICAGO, ILL.

[Read before the Ohio State Dental Society, Toledo, October, 1886.]

It will be remembered that when Dr. Herbst's method of filling teeth was brought before the American Dental Association a little over two years ago, I then stated, that while not doubting that gold could, under certain conditions be well packed into a cavity in a tooth by it, I was of the opinion that the objections to the system were so many and important that its general adoption in practice was neither practicable nor desirable. The opinions expressed was not received with much favor at the time, nor is it certain that many may agree with me now.

Thinking it possible that there might be good reasons for changing this opinion in regard to the matter, I was glad when it was announced that Dr. Herbst was coming to this country to demonstrate his method, and subsequently, that arrangements had been made for his presence at the late meeting of the American Dental Association that we might see him operate and learn from him directly, his reasons for, and the particular advantages of his method.

The acquaintance I made with Dr. Herbst was certainly a most agreeable one. For him, personally I have the kindest feelings, while for his genius I have a great admiration; and my respect for his head and his heart is such, that I do not believe he would desire you or me to adopt his system of practice, or commend it to others, unless it had the approval of our judgement.

That gold can be well condensed by his system I have not a particle of doubt, nor have I ever had. Neither have I any doubt that most excellent fillings may be made with crystal or plastic gold, for I have put in hundreds and I

may say thousands of them. To be frank in regard to this matter I will say, that much of the little, early reputation I may have gained as an operator, was acquired in the use of crystal gold, for during the first few years of my practice in Chicago I seldom filled a tooth without using more or less of it, this being before the introduction of cohesive foil. But because good operations have been made of it, and can be made of it, is not a sufficient reason for its general use in practice, for experience and observation have taught that quite as good operations can be made with less exactness in details and labor, than is required in the use of this preparation of gold.

With a full acknowledgment of the possibilities that may be attained with this form of gold, the exactness and labor required to reach the highest results in its use are so great, that it was long ago abandoned by a large majority of our best practitioners; though some still make quite extensive use of it and all might possibly make a limited use of it to their advantage. Its general use, however, is neither practicable nor desirable, because quite as good results can be reached with foil, with much less time and labor.

I make this reference to the use of crystal gold for the purpose of illustrating and enforcing my ideas in regard to what is known as the Herbst method.

Without attempting to discuss or explain the physics involved in the impaction of gold by revolving pluggers (burnishers). Accepting the proposition as a demonstrated fact, I will, with your permission, state some of the objections which seem to me, must ever hold against its general adoption in practice.

The first I will mention is the great difficulty and sometimes impossibility of reaching all parts of a cavity with the straight and clumsy instruments, that must be used by this method,—cavities which could be readily reached, and the filling material properly packed with the variously shaped hand or mallet pressure instruments to be found in all well equipped operating cases. In many fissures or deep under-

cuts that could readily be filled by the old method, a doubt must always be present in the mind of the operator as to whether by this new method such places are perfectly filled or not, for Dr. Herbst himself admits that the only way he can be certain in this matter, is to test the questionable places with small hand-plugger points. It requires no argument to show that a plugger which cannot be relied upon to make known a defective place in a filling, cannot with certainty be relied upon to make the filling good at that point, for an instrument which is too clumsy or ill adapted to find the defect with, is certainly not well adapted to properly fill it with, when found. If hand- or mallet-pluggers can be more safely relied upon to find and fill difficult accessible points about a filling, than can the Herbst method and pluggers, their superiority for filling the balance of the cavity, or for making simple fillings in easily accessible places can hardly be justified.

Second.—To make this method available we are instructed to cut away so much of the sound and strong portions of the tissue as will make all portions of cavities accessible to these arbitrary and clumsy instruments. To this procedure I object and enter an uncompromising protest, for no one has the right to use an instrument or adopt a system of practice that makes it necessary to sacrifice sound, healthy tooth structure, that could be saved by the use of other materials, instruments or methods of practice.

In preparing a cavity to receive a filling, it is the duty of the dentist to remove all tooth structure that cannot be saved in a healthy and useful condition, but no more. He has the right to cut away as much of the sound structure of a tooth as may be necessary to secure a firm foundation and retention of his filling. But in doing this, it is his duty to see to it that the material used for his filling, is, of its kind, the most easily adapted to the intricacies of the cavity to be filled; also that instruments used in packing it are such as are the best calculated to reach all places in the cavity rendered difficult of access, by virtue of saving por-

tions of the tooth, the removal of which would unnecessarily and forever mar its beauty and harmony. To remove more than this to suit his own convenience, or to enable him to use any particular materials or instruments in filling, might, without a very great stretch of imagination or injustice, be considered mal-practice, in a mild form, at least.

While these remarks are made with special reference to the unnecessary sacrifice of tooth substance, by adopting the Herbst method, I will say parenthetically, that they are not without quite too frequent application in regard to fillings put it with cohesive foil. Teeth that could be just as safely filled and much more of the tooth structure saved by a judicious and skillful use of non-cohesive combined with cohesive foil, are in part, mercilessly destroyed in order that the successful use of cohesive foil, exclusively, may be insured.

Admitting, therefore, that under certain circumstances, good fillings may be made by the Herbst method, but to do which, in other cases, would require the destruction of more tooth structure than would be necessary in making good fillings by other well known methods, I believe its general adoption in practice is neither desirable nor justifiable.

Third.—As "time is often said to be the essence of a contract"—an important factor in the consideration—so too, the time consumed in the use of any particular tools, or instruments, in doing a given thing, when contrasted with the time consumed in producing just as good results with other materials and instruments, is an important factor in wisely choosing the instruments or materials to be used.

In making these remarks I am aware that the claim is made by some that much time can be saved by this method; this I do not believe to be true. The same claim was made for crystal gold when it was first introduced and later, for plastic gold when it came up for our approval. Good fillings, we were told, could with old burs, or most any kind of an instrument, be put in with it in from two to three minutes. In neither case, however, has experience proven

the claim to have been well founded ; on the contrary more time is consumed in putting in good filling with either of these materials than is required with foil. The same history is to repeat itself in regard to the Herbst method. No doubt fillings can be put in by this process very quickly, but the highest results from it will only be reached by it after much painstaking labor.

If, therefore, as I believe is the fact, under favorable circumstances more time is consumed in making good operations by the Herbst method than by those just mentioned, the method is neither practicable nor desirable in this practical and time-saving age, for time is money, not only to the dentist but also to the patient.

Personally I have had but little experience with these rotary pluggers, but I have seen Dr. Herbst and my friend Dr. Rehwinkel operate, and I have witnessed some of Dr. Marshall's experimental operations by this method, and I confidently assert that I have seen better fillings made by hand mallet, and the old fashioned hand pressure methods, and that too, in much less time than was consumed in making the fillings by the Herbst method. My observation has thus far led me to the belief that there is no saving of time or superiority of operation to be obtained by the new method over the old system. Therefore, as a matter of economy, or superiority of results, I see nothing to justify its general adoption.

Fourth.—That quite as good or even better operations can be made under circumstances favorable for the Herbst method, by the use of suitable instruments and non-cohesive foil enameled with cohesive foil, under mallet pressure, and without the necessity of sacrificing so much sound tooth structure.

While the objections to this method as a general system of filling teeth, are so obvious that its adoption is not warranted, it is possible that as an adjunct to other methods of practice it may be made useful ; in fact I believe it can be. From what I have seen I think it can be made useful

at the cervical walls of cavities, especially when the matrix is used. The surface of the pluggers being smooth, and the impact made without violent concussion ; when proper access can be had it should be advantageously used in packing gold against margins of cavities, preventing the fracturing of the enamel which so frequently occurs in the use of the mallet pluggers. No doubt it may be advantageously used in other places, but those mentioned are where its greatest excellence will be found. Could a wise judgment be exercised in determining when and where it could, or could not be used with benefit, I have no doubt that it might with advantage be occasionally employed. The fear, however, is that an over zealous advocacy of the system by its friends will lead many to use it when better results could be secured by the old methods. By its general adoption, or too frequent use, frequent failure would be the result, and the method brought into undeserved disrepute, with its abandonment, even while it could be used to advantage, thereby losing, in a measure, at least, the benefits that might follow from a judicious advocacy and use of it.

Now, Mr. President, having stated to you freely and frankly some of my objections to this method of practice, I trust that no one will think I have had the least intention of being unkind or harsh to any one, for nothing could be farther from my desire. I have only intended by words of truth and soberness, to make my views clear to you—to be approved, or disapproved, by argument, or the test of time, as truth may justify.

For Dr. Herbst I have a great admiration. He is more than a Yankee in invention—as generous as King Lear in giving ; nor is he so conceited that he cannot learn from others ; he freely gives and is wise enough to freely receive. As a profession we are under many obligations to him for the many useful inventions and “ tricks,” if you please, that he has left with us, and we shall gladly welcome his promised return to this country next year.—*Ohio State Journal*.

ARTICLE V.

DRUMINE—THE NEW LOCAL ANÆSTHETIC.

The characteristics and properties of the Euphorbiaceæ are so multiple and so different, that it is scarcely a matter of surprise to learn that one of the order has now been shown to yield an anæsthetic. Dr. John Reid, of Port Germein, South Australia, has recently obtained a local anæsthetic from *Euphorbia Drummondii*, and this drug, for want of a more convenient term, he calls *Drumine*, until chemists give a better name. In his experiments he used the hydrochlorate, *Drumini chloridum*, very soluble in water, and obtained in the following manner: A tincture is made with rectified spirit (though he believes proof spirit would answer especially if acidulated with hydrochloric acid). After standing a few days it is evaporated to get rid of the spirit, ammonia is added in excess, and the solution filtered. The residue, after the ammonia smell is gone, is dissolved in dilute hydrochloric acid, and the filtrate is filtered through animal charcoal to destroy the abundant coloring matter, which is inactive medicinally, but causes a bluish tinge of the skin. The filtrate is evaporated slowly, and leaves the alkaloid. It gives a colorless solution with little taste, almost insoluble in ether, freely soluble in chloroform and water, and depositing from solutions microscopic colorless acicular and stellate crystals, the latter being more numerous in the deposit from aqueous solutions. Roughly speaking the length of the crystals is about one to twenty diameters of a white blood corpuscle (or from 4 to 260 μ m.). Those deposited from hydrochloric acid solution, are filtered through animal charcoal, are circular or boat-shaped at the circumference, and stellate, or perhaps more correctly, discs, as if formed of concentric circles, and with radiating or other fissures. Under high power the acicular crystals are sometimes of a rhomboid shape, and seem less soluble in chloroform; from which it may be suspected that there

are two alkaloids, though Dr. Reid was unable to investigate this point.

Dr. Schomburg, of the Adelaide Botanical Gardens, who determined the species of the plant for Dr. Reid, states that many sheep and cattle are annually killed by eating it, and that it is more poisonous according to the quantity of milky juice which it contains. It is said that animals die within twenty-four hours to seven days after eating it, all being paralyzed in the extremities, and some hanging the head as though intoxicated, though the appetite does not seem to be impaired. It is also said that yellow eyes, and even jaundice, occur in some cases. Its most remarkable and valuable effect, however, is that of causing local anæsthesia. When a few drops of a watery solution, estimated at 4 per cent., was dropped into the eye of a cat, the eye was found in a few minutes to be tolerant of contact with the finger, and the orbicularis muscle did not contract firmly as did the other. The pupil was not appreciably dilated. Three grains injected subcutaneously into the back had no other apparent effect than local anæsthesia. When Dr. Reid applied it to his tongue, nostrils and hand very marked anæsthesia was produced; even the sense of taste for quinine was abolished on the side of the tongue to which it was applied. Small doses taken internally seemed to produce no constitutional effects. In a case of sciatica in an old man, in which he had tried iodide of potassium and ammonia, the first hypodermatic injection of 4 minims of a 4 per cent. solution, enabled him to stand and walk in a short time with comparative ease, the pain having disappeared. A second injection, on the following day, acted as well, and at the time of writing the report the pain had not returned. Dr. Reid used it for cases of sprain, and the "speedy effect is probably sufficient to allow us to bid farewell to evaporating and lead lotions. I have seen it work like magic in a boy, (boil?) the dose being the same, and injected over the adductors of the thigh. For tic I have dropped it into the eye and applied locally with success."

In regard to the physiological action of drumine: "Where death arose from an overdose of the drug, paralysis of the extremities occurred. . . . and we may suppose that the posterior cornua of the cord (sensation) are primarily affected, the poison passing to contiguous parts. I am very much inclined to believe that reported cases of paralysis are neither more or less than cases in which movements remain, but the sense relations with the external world exist to a very limited extent, while motion is still possible. . . . It will be seen that strychnia, as an antidote, affects only the motor parts, there is *possibly an antagonism* to a slight extent between chloroform and the drug.

. . . There seems to be no special action on the pupil, although the cornea is insensitive by local application. In no case have convulsions followed its use. To sum up; cocaine seems to have a mixed action, sensory and motor, to cause preliminary excitement—Drumine is almost a pure sensory (no action on the pupil) paralyzes, without preliminary excitement; can be given with comparatively slight, if any, risk. A fungus is generated in the drug solution after some days. Its uses may be summed up as follows: Nerve troubles of a painful character, not due to a constantly exciting cause which remains potent, operations, irritation, œdema, sprains and such like; but I believe there is a brilliant future for this drug in the domain of cerebral physiology on account of its almost purely topical action. For hydrophobia, and croup with spasms, it would be used fearlessly and applied either to the nostril, by spray, or with a very fine hypodermic needle into the larynx. Those daring spirits who inject antiseptics, *e. g.*, corrosive sublimate to the phthisical lung, will probably, in this drug, find a valuable adjunct. Let us hope, from its causing no preliminary excitement, it may be useful in peritoneal and bowel ailments of a painful nature, whether by hypodermic needle or by the mouth. Writer's cramp and its congeners appear to indicate its use." In cases of poisoning by it Dr. Reid would recommend Epsom or Glauber's salts alone, or com-

bined with tartar emetic in small doses, with plenty of fresh food, in order to eliminate it and act antidotally.

Of course the correct interpretation of facts, on untrodden ground, with a limited supply of a drug, and without such apparatus for manufacture and experimentation as would be desired, is very difficult; and certainly no one would be inclined to quarrel with Dr. Reid for not telling us more about *Drumine*—on the other hand, the world is his debtor, especially that portion of the medical world which is in the habit of making annual addresses, and which has been ringing the changes on cocaine for two years. Let us hope that, so long as they have no new facts to present, they will at least give part of their attention to *Drumine*. Dr. Reid's interesting paper may be found in the *Australasian Medical Gazette* of October 15, 1886.—*Editorial Journal of Am. Med. Association.*

ARTICLE VI.

A SUPERIOR WISDOM TOOTH DISCHARGED
FROM THE NASAL PASSAGES;
WITH REMARKS.

BY JOHN S. MARSHALL, M. D., CHICAGO, ILL.

[Read in the Section on Dental and Oral Surgery at the Thirty-Seventh Annual Meeting of the American Medical Association.]

I am indebted to Dr. Emma F. Gaston, of Chicago, a member of this Association, for the history of the following very remarkable case, and which I present with a few remarks in explanation of the peculiar symptoms, the probable course taken by the tooth, and which finally resulted in its being discharged from the posterior nares.

"Mrs. B., aged 62, in October, 1884, suffered intensely from what she supposed to be 'a severe cold in the head.'

The pain in the right orbital region was at times excruciating, but not more severe than she had often experienced in other portions of the face and right ear, during the previous ten years. Attacks of facial neuralgia and otalgia had been so frequent during these years, that she had become quite disheartened and had no expectation of ever being freed from them.

"Medical aid had only temporarily alleviated her suffering, and she had become 'tired of consulting physicians' about 'neuralgia.' In this attack the usual domestic remedies for a cold, and an anodyne application for neuralgia had been resorted to without alleviation of symptoms. The right nostril became slightly swollen and completely obstructed. Breathing was almost impossible when the lips were closed.

"After a few days of discomfort, the patient made an unusually great effort to relieve the nostrils, by alternately coughing, and blowing the nose. Suddenly she felt something fall upon her tongue. Spitting the mass into the wash-bowl, she heard a clicking sound, which caused her to examine it. Imagine her surprise at finding a large right superior wisdom tooth covered with foetid pus. The relief of the facial pain was immediate, 'the cold in the head' was explained, and probably much of the 'torture' she had endured periodically for years, was also accounted for.

"This very unexpected experience led the patient to recall an incident which occurred about twenty-six years before. In the year 1854, thirty years previous to the expulsion of this 'eccentric tooth,' she had all her upper teeth removed. Wore a 'temporary set' of artificial teeth for several months, then had a 'permanent set,' on gold plate, which she wore with great comfort, for four years. Then a tumefaction appeared upon the right superior maxilla, near the tuberosity; and she jested about 'cutting a wisdom tooth.' Consulted her dentist about the 'plate.' He found that in perfect condition, and assured her there was no prospect about a tooth, and was unable to assign any satisfactory cause for the suffering.

"After a few days the annoying swelling and tenderness disappeared, and from that time until 1884, no thought was ever given to those unexplained symptoms.

"In May, 1884, the patient suffered from an abscess in the right ear. After the abscess ruptured an unusual amount of hæmorrhage from the ear occurred. The patient became very much weakened by it, and a physician remained at her bedside for hours.

"Previous to this date she had gradually lost the power of hearing on that side, and was afterwards totally deaf in that ear. There had also been a slight foetid discharge from the nasal passages for several years, but which was supposed to be the result of a simple catarrhal affection."

Remarks: It would seem from the foregoing history that all the pain and discomfort in the right facial region endured by this lady for so many years, was the result of this erratic tooth, and the explanation I would offer is as follows:

The swelling and tumefaction mentioned as having appeared at the posterior portion of the right superior maxilla about five years after the extraction of the superior teeth, viz., twenty-five years ago, was undoubtedly caused by the eruption of this tooth, (and it must have been formed in an inverted position) which, taking a direction upwards and forwards, finally pierced the floor of the antrum of Highmore. The disappearance of the tumefaction, and all unpleasant symptoms speedily passing away, would I think, be a fair inference that this was what occurred. The tooth must, however, have remained in this position for several years, as I think the condition of the tooth would strongly indicate, for you will notice the crown is covered with a thick dark-brown deposit which is very rough upon its surface, while upon its roots there is considerably less, and they have the appearance of being exposed to the effects of the antral secretions for a much shorter period of time. The aural abscess, and this tooth, I think have a very close relationship as regards cause and effect; and I am of the

opinion that the abscess in the ear was the result of an abscess at the roots of this tooth, and which discharged its contents into the meatus, and at the same time freed the tooth from its crypt in the maxillary bone and left it loose in the antrum.

The tooth being loose finally found its way to the anterior portion of this cavity and lodged there, and by contact with its nasal wall produced ulceration of this and the inferior turbinated bone, and thus found its way into the nasal passages and into the mouth.

The slight catarrhal (?) discharge which had been persistent for so many years was without doubt the result of the presence of the tooth in the antrum. The record of the case is valuable from the fact that it explains an obstinate case of persistent neuralgia of the trifacial nerve, and indicates the probable cause of a severe aural abscess. The symptoms of the case were, however, so obscure and indefinite in their character as to give no indications of their real cause, and the presence of a tooth or other foreign body in the antrum was not even suspected.—*Jour. Amer. Med. Association.*

ARTICLE VII.

A LOGICAL INFERENCE.

BY FRED. A. BELLAMY, STREATHAM.

A gentleman, aged about 40, of exceptionally fine physique, consulted me in the early part of 1885, complaining of suffering excruciating neuralgic paroxysms in the right facial and temporal regions at irregular intervals—once or oftener—during the day and night. He had visited two dentists (one of high repute) who had extracted two sound teeth—having, as they asserted, diagnosed exostosis, which proved upon extraction incorrect—and the operations caus-

ed no modification of the pain. Patient, who had prior to this been under the care of a general practitioner, and was still undergoing systemic treatment, at this stage consulted me—some three week subsequent to the last of the former operations. His anguish was temporarily relieved, as he assured me he could now localize the seat of pain in the right lower six-year molar. I carefully examined the tooth he indicated, as also all the others, but could not detect a trace of decay in any of them, and they all responded freely to the thermal test. He appeared so elated at being able himself to positively centralize his trouble in the said tooth that he insisted upon having it immediately removed, observing "he had already suffered enough in the interests of science, and now he would like to have a word in the matter himself."

Persisting, naturally enough, on this line of argument, I, though loth to do his bidding, extracted the condemned tooth under gas, but to my disappointment found it, on examination, perfect in every particular. He left apparently satisfied that, at least, he had had his own way, and I saw no more of him till about a year after, when he again called upon me to ascertain if there was a "fish-bone" stuck in his *left upper* six-year molar. I failed to discover any foreign matter in the tooth or its vicinity, but found I could introduce a fine probe in a crown fissure of the same tooth, and by my advice he returned the following day to have it stopped. Before commencing operations, I inquired whether the former neuralgic pains had disappeared. He told me that as the last extraction recorded above effected no benefit, he lost faith in dental assistance, and consulted first one, then another of our most eminent physicians and specialists; but no relief could they extend to him, till the last one he consulted required him to sever himself from London and business for a while and retreat to the mountains of Switzerland. This advice he followed as a *dernier ressort*, dwelling for a few weeks in a village situate at a great altitude, where the rarified and pure atmosphere invigorates

the nerves to a healthy reaction. After a few days' sojourn he said the effect was marvellous; those awful paroxysms totally disappeared, he felt another man and "lived" again.

Contenting myself with the examination of the previous day, I immediately set to work to bur out the fissure, and after nearly impinging upon the pulp chamber without obliterating the crevice, I ceased excavating, suspecting the tooth might be cracked instead of attacked by caries—a suspicion that a closer examination confirmed—for I found the tooth split through its entire length, the two buccal roots being attached to the one half and the palatine to the other—the two halves being very slightly individually mobile. As a matter of course there was no vitality existing in the pulp, so I tightly bound the tooth around its neck with gold binding wire (the neck being too constricted to allow a collar to be slipped over the crown), and having further excavated the two halves after a dovetail fashion, inserted a filling of Sullivan's cement, and I believe the operation may be pronounced a success.

Now, would it be a very illogical hypothesis—no new one—to assume that that identical tooth was the origin of all the agony the patient had endured; the pulp having sphacelated, the gases generated by which found no exit, till the tension on the surrounding walls was greater than the natural cohesion of the molecules of the tooth-substance could resist, when they separated to allow the pressure to diffuse itself? I was informed by the patient that he had never used his teeth rashly, nor could he recollect any particular sensation at any time in connection with this tooth, save on the occasion when he imagined a fish-bone had become fixed in it. Might one not even go so far as to deduce from the history of the case, that his relief dated from the bursting of the tooth, which took place at the Swiss village, and which was possibly caused or accelerated by the altered climatic conditions surrounding it at that time?

There is, as I have stated, nothing novel in this—on the contrary, the theory here propounded is antiquated—

nor is there attached to either of the incidents here chronicled any special interest, if taken separately; but studied conjointly and in their sequence, it decidedly, I think, confirms the legitimate conclusions of yore, as to the power of the gas evolved from the disorganized pulp tissue within a tooth.—*London Dental Record*.

ARTICLE VIII.

CANCRUM ORIS.

At a meeting of the Cambridge Medical Society, held on October 8th, Mr. Wherry related a case of cancrum oris that was lately under his care in Addenbrooke's Hospital. A female domestic servant, aged twenty-five years, had a deep ulcer filled with yellow slough, occupying the whole of the inside of the left cheek, said to have begun as a gum-boil. The ulcer was almost painless. The skin of the left cheek was dusky red in color over the slough, was nearly destroyed, and eventually there was a perforation through the cheek. The separation of the slough was at no time accompanied by any hæmorrhage, there seemed to be no granulating surface to bleed, and there was only a thin watery discharge and faintly tinged saliva. Her complexion was remarkably pale-yellow and wax-like. The fever was high and the pulse rapid. The register on the chart was usually 104 degrees to 105 degrees, and the pulse 160 or more. She had been ailing four or five weeks, and had suffered from the ulcer two weeks before admission. No treatment was of any value in checking the progress of the malady, and she died exhausted in twelve days. She had always a good appetite, partook heartily of a liberal diet, and did not consider herself very ill. On two occasions operations were performed under ether. At first the slough was cleared out and the cavity left was swabbed freely with nitric acid. At a later stage the cheek was laid freely open

from the outside. Quinine stopped the rigors which occurred occasionally. Iron was also given, and later on opium. Condy's fluid and insufflation of iodoform were tried locally. This patient was always pale and perhaps anæmic, but she was not ill-fed or ill-nourished, nor was she recovering from any acute fever. She had been able to do her duty as a domestic servant until attacked by disease. Mr. Wherry mentioned the reasons for making a difference between cancrum oris and other conditions somewhat similar, as ulcerative stomatitis. It was not a case of acute necrosis of the upper jaw. Though as yet no organism had been isolated from the blood or tissues, nor had the disease been inoculated, it seemed probable that in the future, as in the case of anthrax, a definite micro-organism would be discovered in cancrum oris. Animals injected with the blood of patients suffering from cancrum oris died of septicæmia, usually with peritonitis.—*The Dental Record*.

ARTICLE IX.

THE ODONTOLOGICAL SOCIETY OF GREAT
BRITAIN.

The first Ordinary Monthly Meeting after the recess was held on the 1st November, Mr. CHARTERS WHITE, M. R. C. S., L. D. S. Eng., President, in the chair.

The PRESIDENT, in a few appropriate sentences, welcomed the members back to the scene of their labors, and hoped that their renewed energies would be brought to bear in furthering the welfare of the Society and the profession generally.

The announcement by the President that it was proposed to honor Mr. George A. Ibbetson by electing him to honorary membership was heartily received, and subsequently the election was unanimously carried by show of hands.

Mr. STORER BENNETT, the Curator, reported several additions to the museum; among them were two specimens sent by Mr. Dunn, of Florence, who thought them two jaws from an Etruscan tomb. In that case they would be highly interesting, as they would probably be about 2,500 years old—not more than that—as prior to that period the Etruscans practiced cremation. The Curator also announced that the Society had purchased the skull of a Manatee.

At the request of the president. Mr. HEPBURN (one of the Secretaries) read a letter from Mr. James Parkinson, the Treasurer, announcing the felicitous terms the presentation to the Society of the portrait of Mr. T. A. Rogers by a few of his friends. The letter dwelt upon the esteem and regard in which Mr. Rogers was held; to the great services he had rendered to the Society and the profession generally during the last thirty years. It referred to his being one of the active Secretaries at the first meeting of the Society in 1859, which office he held until 1861; to the services he had rendered on the Council; to his being unanimously elected President in 1865, and again in 1881. Reference was also made to the various other offices he had filled outside the Society, and to the qualities of kindness and geniality which distinguished him. Mr. Parkinson concluded by trusting that the Society would receive this addition to their walls with a hearty welcome.

The announcement was warmly applauded, and the PRESIDENT, in accepting the presentation officially in the name of the Society, said it was perfectly unnecessary for him to supplement the eulogium contained in Mr. Parkinson's letter, as he felt those remarks really required nothing to be added to them; but, in his capacity as President, he accepted the portrait in their name, and felt they would never look upon that counterfeit presentment without thinking of what represented amiability, dignity and warm-heartedness.

Mr. STORER BENNETT showed models and mentioned a case of imperfect dentition which had been brought to his

notice by one of the students of the Dental Hospital (Mr. Colyer.) a short time ago. It occurred in a girl, age 16, who had in the lower jaw only two permanent molars, four temporary molars, two canines, and two incisors; the incisors were small wedged-shaped teeth, the jaw itself was small. Although the teeth were deficient in the lower jaw they were very much more so in the upper jaw, which contained only the roots of two canines and the roots of two first permanent molars. Inquiries into her family history failed to reveal anything which would account for the abnormality.

Mr. C. S. TOMES also mentioned a case somewhat on the same lines as the foregoing. In a man, aged about twenty-five, on both sides of the lower jaw and on one side of the upper jaw, the whole molar series were down to the level of the gum. On the right upper jaw the six-year-old molar and the twelve-year-old molar were down nearly to their normal level; but the occasion of his consulting Mr. Tomes was that the twelve-year-old molar was very painful, and on looking at it it seemed as though the wisdom tooth was pressing upon it. On taking hold of it, to his surprise, it came away; it had not, and never had, any roots. He then examined the six-year-old molar on the same side, which was also down to the masticating level, and he thought it was a matter of legitimate inference that none of the molars had any roots. Mr. Tomes thought the point of interest was the fact of three separate checks at three different periods, viz., at the six-year-old molars, the twelve-year-old molars and the wisdom teeth. Mr. Tomes also showed a central incisor which had been placed in his hands by Mr. J. S. Turner; who had extracted it because it was loose. When he took it out he found it had no root; there was no history of an accident, and nothing was left in the socket, so that it had either never formed its root or else it had been absorbed.

Mr. R. H. WOODHOUSE, on examining the tooth, said it had been stopped at the side, and the stopping had been there some years; the stopping on the mesial surface would

give considerable pressure and, he suggested, would probably account for development having been arrested.

Mr. COLYER mentioned a similiar case to those referred to by Mr. Storer Bennett and Mr. Tomes, which occurred in his father's practice. A gentleman, aged about thirty, had, of the permanent set, only the four six-year molars; there were also seven temporary molars, and two malformed incisors, one in each jaw. Beyond suffering from indigestion he was healthy and well developed. The temporary teeth were extracted and artificial dentures fitted. These he had now worn for some years, but no more teeth had made their appearance.

Mr. S. J. HUTCHINSON brought before the notice of the Society one or two little contrivances which he had found useful in his practice. He said that at several previous meetings they had had many interesting hints from Dr. St. George Elliott—little methods shown which he had found useful in practice. He (Mr. Hutchinson) first alluded to a difficulty which they must all have experienced in mounting gum sections, viz., that of avoiding the dark lines in the joints. One way of overcoming this was to put the case in chlorate of lime for six or eight hours, which would entirely clean out the black lines which disfigure gum blocks. Another matter was with reference to pivot teeth. He did not know what the usual practice of members was, but one cuts off a tooth, drills out the fang, and prepares it in such a way that the patient is to come again for a pivot to be fitted in, and goes away with a gap in the mouth. Now, to avoid this gap in the mouth, it was his custom to have a number of what he might call "jerry built" teeth ready, a variety of shades of incisors, laterals, and canines, which might be fitted in temporarily.

Another small hint. Probably they had frequently been troubled in matching artificial teeth where one or two necessary teeth had been wanting; the natural teeth were too dull on the surface or coated with tartar, and nothing would enable them to get a good match. Perhaps it has been the

practice to scale the tartar off; well, a little fluoric acid wiped over the artificial teeth would give them just that roughness which would make them undistinguishable from the natural ones. The fluoric acid must be kept in a gutta percha bottle.

Lastly, would he mention a way of getting "a dentist's third hand;" and that was a very simple way of fixing to a mouth mirror a small piece of wire which could be pierced into a cork. The cork can then be placed between the patient's teeth and the mirror fixed at any required angle. This second mirror would be found very useful on foggy days in focussing a ray of light.

The PRESIDENT, remarking upon the interesting nature of the hints, said he was glad to have these little "wrinkles" brought forward, believing that they contained the germ of much that was useful. The suggestion with reference to pivots was a very practical one. There was nothing more annoying to a lady patient than to have to proclaim to her friends, by the sudden appearance and disappearance of a gap, that she had taken to artificial teeth. At the same time, he thought that these temporary pivots should be made very secure.

Dr. ST. GEORGE ELLIOTT inquired how Mr. Hutchinson fixed his temporary pivot. A plan which he sometimes adopted as a temporary expedient, in order to ascertain whether a root would bear a pivot or not, was to take an ordinary plate tooth, attach to it with soft solder a German silver pin, insert this into the foramen, and pack amalgam round the head and against the back of the tooth. This could be done in from fifteen to thirty minutes.

Mr. HUTCHINSON replied that he used a hollow pin and floss silk, and took care to make the tooth secure. He had no fear of the patient not returning to have the operation completed; the effect of his temporary stop-gap was not good enough to satisfy a patient even for six weeks.

Mr. F. J. BENNETT said, with regard to jointing continuous gum work, it is the first importance to have them

fitting well; but the black line might be prevented by rubbing a little fossiline or osteo over the crack and allowing it to harden. He would like to ask if anyone could tell him how to prevent the black oxide which forms on the cutting surface of American teeth.

Dr. ELLIOTT remarked that it might not be generally known that the characteristic difference between American and English teeth is, that the former are *pressed* into the mould while the latter are *poured* in.

With reference to another matter, most of the members would be aware that next year there is to be a meeting of the International Medical Congress at Washington, and he had received a letter from Dr. Taft, acting for the Dental Section, stating that they desired to ascertain at the earliest possible moment who would prepare papers and work for the Section of Dental and Oral surgery, and asking him if he would give him the names of 15 or 20 dentists in Great Britain and Ireland who could, and would, prepare papers. It was intended to prepare 10 or 12 operating chairs for the best operators in the world. Benches, lathes, &c., would be provided, and facilities would also be made for various branches of scientific work, operations and treatment of exposed pulps and diseased gums, clinics also would be arranged for.

The PRESIDENT said no doubt many of the younger members would avail themselves of the invitation, although he did not think he should venture to do so himself.

Dr. ELLIOTT: It is very necessary that the Secretary should know in advance the names of the gentlemen who intend to accept the invitation. He would like to say something which was foreign to the subject, viz., that the two colleges, Harvard and Michigan, had lately resolved that the preliminary examination can be held in this country, and, he believed, in any other country.

Mr. WALTER COFFIN said he had been requested by the inventor of a new process—a process for permanently facing vulcanite plates with a metallic surface—to introduce the subject to the notice of the Society. Mr. M. G. Cun-

ningham had specimens which he would show the Society, and from a very long acquaintance with vulcanite work he (Mr. Cunningham) had come to the conclusion that it would be an advantage to place a metallic surface on the rubber rather than by swagging in the usual way.

The method seemed, shortly, to be this: When the ordinary vulcanite piece was so invested in the flask that the flask is open, the unpacked rubber was to be separated from the model and a thin layer of filings or precipitated gold was first spread finely between the model and the vulcanite, then upon either one or the other both a thin layer of calico was placed to prevent the further squeezing of the rubber. The process seemed only to add a few minutes' labor to the ordinary process of making a rubber piece. Mr. Cunningham also wished him to say that a surface properly prepared in this way could be increased by the electro process to any thickness.

The PRESIDENT remarked that he had had the pleasure of seeing the specimens which Mr. Cunningham had brought, and they certainly added very much to the beauty of the piece, but he was puzzled to understand how an interrupted surface of metal could be made continuous by the bridging over of the intervening spaces of non-conducting material.

Mr. CUNNINGHAM replied that whatever the explanation might be, there was no doubt of the fact that the interrupted surface first obtained could be made continuous by electroplating.

Mr. WALTER COFFIN: The surface of the rubber, when it first comes out of the flask, is of course, not a continuous surface but a mottled surface, therefore practically each deposit would be separated from its neighbor surrounded by rubber; they, therefore, had a discontinuous surface to commence with. The interesting point to him was, that the surface might be deposited upon *electrically*. He had made some experiments himself, with a view of testing this, with the result that he had himself been unable to get any deposit on a surface fairly well covered with *gold filings*, but with a

gold *precipitate* he had been able to get a very fair deposit. The only point, to his mind, seemed to be whether or not a sufficient quantity of precipitate could be used, a great deal being lost in the process. He felt bound to say that his experiments were hardly fair to Mr Cunningham, as he had made them quite in an independent way.

Dr. WALKER had tried the process that Mr. Coffin had so clearly described to them, and Mr. Cunningham had kindly called on him and explained the process he was endeavoring to induce them to adopt. He had previously tried electro-plating dentures and, so far as he had gone with it, his first experiments were the same as Mr. Coffin's, and he found in a very short time the deposit stripped from the vulcanite; but when he saw Mr. Cunningham's method, and adopted it, he found he got a clear anchorage for a deposit of gold. He tried an upper piece, and was most careful as to the cleaning of the filings, and, to his great pleasure, it came back beautifully electroed. It had been worn by a patient five weeks and had been returned to him; he had washed it in soap and water, and the deposit gave no evidence of rubbing or wearing off. He had made some three or four cases of this process and, while so far successful, the longest test he had given them was five weeks' wear.

Mr. CUNNINGHAM said the point which appeared to him to be of great importance was to get an electro deposit in the first instance. He was not surprised that an amateur should fail to get a deposit, but he was very much surprised that a professional electro-plater should be unable to do so. The surface merely required to be "quickened" by dipping into a bath of nitrate of mercury, a practice known to all electro-platers.

Mr. COFFIN desired to explain that he particularly instructed his electro-plater to use no preparation to facilitate the deposit, as he understood Mr. Cunningham that his method rendered it unnecessary.

Mr RYMER said he had no doubt many members in for-

mer years used gold leaf, as he had done, for coating vulcanite, and it gave a very pretty surface, but the difficulty with the gold leaf was that it got worn off by friction. The question to his mind was, what thickness would be necessary to prevent its wearing off by this method?

Mr. COFFIN had tried years ago every means of coating rubber by the use of plain gold leaf and sponge gold leaf, and he was inclined to think it was not so much *wear* as *peeling away* that had been the difficulty.

In reply to questions by the President, Mr. COFFIN said that it was a very interesting scientific question as to how the conducting is brought about, but he believed the theory was, that the deposit takes place and spreads—like a blush, as it were—from the conducting point over the whole surface. Referring to his experiments, he found that the deposited coat was perfectly inseparable from the surface, and he felt it due to Mr. Cunningham to say that those preparations in which he had succeeded had been done without any preparation of the surface used in the trade such as he spoke of. He had used extremely fine particles, but upon the precipitate the electro deposition was perfect.

Specimens of the work were handed round and admired, and, there being no further discussion,

Mr. WALTER (of Germany) showed and explained a hydraulic press for obtaining well shaped plates, and the meeting separated.—*London Dental Record*.

THE LOUISIANA STATE DENTAL ASSOCIATION.

The annual meeting of the Louisiana State Dental Association will be held in Tulane Hall, at New Orleans, La., on the 23d, 24th and 25th of February, 1887.

A cordial invitation is extended to the members of the profession throughout the States to attend.

No efforts will be spared to make our guests comfortable and the meeting interesting and profitable.

An opportunity to witness the Mardi Gras festivities will be afforded those who come, also, favorable railroad rates may be had at that time as the Mardi-Gras takes place the day before meeting. For further information, address

P. J. FRIEDRICH, *Chr. Ex. Com.*

155 Carondelet Street, New Orleans, La.

Editorial, Etc.

UNIVERSITY OF MARYLAND, DENTAL DEPARTMENT—ANNUAL COMMENCEMENT FOR 1887.—The classes in this Dental Department have become so large that separate commencements will hereafter be held ; that for 1887, will take place on the 16th day of March next at the Academy of Music, Baltimore City.

The custom heretofore has been to hold the commencements of the Medical and Dental Departments of the University of Maryland at the same time and place. But the Graduates of the Dental Department will be so many this year that it becomes necessary to hold a separate commencement for each Department—namely, Medicine, Law and Dentistry.

The present graduating class is the largest ever known in this section of the country ; and the same may be said of the matriculates for the present session of 1886-87. The many friends of the University of Maryland will be pleased at this announcement of the continued and unprecedented success of its Dental Department from its organization, which is an evidence of the reputation it sustains throughout the civilized world.

THE PASTEUR METHODS—Dr. Christopher Johnston read before the Baltimore Academy of Medicine a paper on his recent visit to Pasteur's dispensary and laboratory in Paris. Many foreign doctors were present at Pasteur's headquarters, eager observers, and there was also a numerous attendance of persons bitten by supposed rabid animals. Dr. Johnston said that recently bitten persons were inoculated with a thin pulp, made by crushing a portion of a dried spinal cord, ten days old, from a rabbit dead of rabies or hydrophobia. On the second day a ninth-day cord was employed, on the third day an eighth-day cord, and so on until the fresh cord of the pre-

ceding day was brought into requisition. Eighty-four patients were treated by the above method the day of Dr. Johnston's visit. But 351 persons were bitten last year in France by rabietic animals, yet M. Pasteur treated 1,700. The excess came from other countries. Rabbits die in six days when inoculated. They are inoculated from the brain of a rabbit which died of hydrophobia, while Pasteur's patients are inoculated from the lower part of the same rabbit's spinal column. As to the practical working of the system it was objected by Dr. Johnston that enough has not been done to demand the acceptance of Pasteur's theory. Time and the future labors of Pasteur and others must develop the truth that may reside in Pasteur's plan of treatment. Dr. Von Frisch, of Vienna, and Pasteur both fully inoculated animals, the former rabbits and the latter dogs, and then attempted their cure. All of Von Frisch's rabbits died, and Pasteur had only "a partial success." Pasteur objects to the slow method of Von Frisch, and urges rapid and repeated vaccinations, but his own success was but "partial".

Monthly Summary.

FATAL RESULT OF PEROXIDE OF HYDROGEN INJECTIONS.

—A Norwegian surgeon, Dr. Laache, has reported a case in which a fatal result followed an injection of peroxide of hydrogen into the pleural cavity. The patient was a man 28 years of age, who had had a portion of the ninth and tenth ribs resected, for empyema. The operation had been successful and the wound progressed favorably, and two months after the operation there remained only a fistula about an inch and a half long. In order to hasten the healing of this, hypodermic injections of a 3 per cent. solution of peroxide of hydrogen were resorted to, as this method of treatment had given very satisfactory results in two somewhat similar cases in which it

had been tried. Six injections, each containing 0.8 cubic centimetre of the solution, were administered without any particular effect. At the seventh however, the patient complained of pain and faintness, the pulse failed, the respiration became oppressed, clonic contractions occurred in the right arm, the head turned to the left, the jaws became tightly set, the face became cyanotic, and the patient died in ten minutes. The necropsy, which was not made till forty-eight hours after death, revealed nothing very striking. The heart was dilated, and contained liquid blood without air bubbles; some ecchymoses were found in the parts of the left lung, which were adherent to the chest walls. In the fourth ventricle of the brain an ecchymosis the size of a pin's head was seen. A number of air bubbles were present in the blood of the hepatic veins, and some were seen on cutting into the spleen and kidneys. The cause of death was therefore by no means clear. Dr. Laache suggests that it may have been the small extravasation in the fourth ventricle or shock. Dr. Wulfsberg, who took part in the discussion on the case at the Christiania Medical Society, thought it was probably due to the introduction of the drug into the circulation. He thought that the strength of the blood current might have carried the peroxide, if introduced into a vein, through the right heart and lungs almost unchanged, but that afterwards more oxygen might have been disengaged than the blood could absorb, and bubbles were thus produced, which may have been the immediate cause of death. Where animals have been subjected to injections of air into the veins bubbles are not always found in the blood. In these cases Dr. Wulfsberg thinks that death has been due to paralysis of the heart, for when examinations have been made immediately after death bubbles have been found in the coronary arteries. As so long a time had elapsed before the necropsy in Dr. Laache's case, these might have been absorbed.—*London Lancet.*

HOW TO BECOME A GOOD DENTIST.—*Dr. B. H. Teague.*
—After two years of close application under a conscientious and painstaking preceptor, the student is then ready to enter the dental department of a university. The intervening time

between the winter sessions should again be spent under the supervision of the preceptor; and after graduation a year with him as an assistant, will be of much benefit to the newly fledged dental doctor.

It has been my observation that the graduate who has not availed himself of the benefits of a private tutor, may be skillful after a manner with cohesive gold, may know little of non-cohesive gold, is sure to dislike amalgam and other plastics, and is a very indifferent plate-workman—even with rubber. He is a bungler at such fine prosthetic dentistry as pivoting, cap-crowning, and bridge-work. In fact, is almost an ignoramus, practically, in all that relates to artistic metal work. Often I have had said to me, "Why, Doctor, they never taught me *that* at college." The colleges cannot demonstrate everything. In all probability, the different phases of practice are described in the lectures; but the most interesting and special practice is not practically taught the student, unless occasionally by some dentist invited to give a clinic. The patients who are served at the college infirmaries are generally poor, and do not demand anything more than either simple operative or mechanical dentistry. The scope is therefore limited as compared with the daily routine of a busy dentist. A graduate who has received instruction only within the walls of a college should place himself with a well-established dentist as an assistant. The time spent will not be thrown away. A practical knowledge will be thus gained to help him over many of the rough and troublesome obstacles in practice. He will better satisfy himself and more efficiently serve his patrons, and receive the greater pecuniary return from future practice.—*Ex.*

IN FILLING PROXIMAL CAVITIES, should the teeth be wedged previous to filling, or cut apart and permanent separations made? Which plan will be likely to result in the most good, both as to durability and comfort to patient? I should say as a general rule it is best to wedge the teeth rather than cut spaces, and yet many times the latter seems the best plan to adopt. I consider this one of the most difficult questions to decide in dental practice, and one requiring much thought

and good judgment. The shape of the teeth, the way they antagonize, the tendency for caries to recur, the character and shape of the gums, the age of the patient, and care taken of the teeth, must all be taken into account. As a general rule, teeth that are wide at the grinding surfaces and small at the necks should not be cut apart, because the wide space at the gums interferes with mastication. If the gums and alveolus are heavy, there is apt to be a pocket formed, which adds greatly to the chance of caries recurring, besides giving discomfort to the patient in chewing, if permanent spaces are made through to the gums.

If the occlusion is such that when spaces are cut the teeth will soon crowd together again, cutting apart is generally bad practice; or if the patient is quite young, so that the teeth scarcely occupy their natural positions, cutting apart is hardly justifiable. On the other hand, where there is much tendency to caries with a lack of care on the part of the patient, contouring is not good practice, because the time and exhaustive labor required for such operations are almost sure to be rewarded by a quick recurrence of caries. Permanent separating is then almost the only thing left. So that no special rule can be given, but each case must be left to the careful study and good judgment of the operator. Cleanliness is also very important. Till we get patients to doing their part in taking proper care of the teeth, it is of but little use to try to make permanent operations. This is especially true with regard to children. I have repeatedly sent children home and set another time for them to come on purpose to examine and show them where they fail in this particular. It is said that the pulp-capping practice has changed. I have seen no reason for changing my practice in this particular. I cap pulps quite as frequently as I ever did, have quite as much faith in it, and believe any practitioner who does not cap pulps falls far short of his duty.—*Dr. J. N. Crouse.*

PERSONAL CLEANLINESS AND UNPLEASANT ODORS, AND DISEASE.—Sometime since, referring to personal offensive odors, we laid stress on keeping the entire body clean, of hav-

ing good digestion, and of avoiding foods tending to taint the perspiration. We would like to extend those remarks.

And to the last first. A dentist certainly has no right to eat cabbage and onions and other offensively odoriferous foods. And if these are to be avoided because of their offense to others, we should seek those things which produce a pleasant aroma. A dish of nice strawberries or pineapple, a handful of wintergreen berries and an occasional piece of sassafras, spike-nard, ginseng, and many other vegetables, fruits, and aromatics, impart to the breath and to the insensible perspiration an agreeable aroma that should be prized. If *something* must be chewed, instead of giving your patients the abominable stench of nasty tobacco, take tolu, tumeiac, or almost any of the balsams.

But be as careful as we may of what we eat, or use aromatics as much as we may, if we give the stomach more food than it can digest, there will be a decay of part of it which will send out defecation and disease into all parts of the system, and surround the body with the odor of death. Most of us eat too much, and our food is too rich and concentrated. We are gormandizers, and it is no wonder so much is rejected by the delicate digestive follicles; and that the rejected matter sends out the offensive smell of putrefaction. Yes, and more than this, the blood made by such a mass as is in the stomach, cannot be healthy. Therefore, as one organ after another receives the illy prepared blood, with effete matter circulating in it, we have impaired function and a diseased condition of the organs. The organ that is the weakest becomes the most affected, and then we name the disease after that organ. The poisonous matter thus taken up by the lymphatics is also brought to the skin to produce pimples and blotches and cutaneous affections; on its way it clogs the circulation, producing what we call rheumatism and other painful disorders. Thus we have from undigested food disorganized and disorganizing matter. O, my; what foolish creatures we are! How much easier it is to prevent disease than to cure it. We sometimes think it is a sin to be sick; we would be almost sure of it if we were not occasionally sick ourself. It is certainly often our own fault.

But though we may be judicious in the quantity and qual-

ity of our food, there will be offensive material and gases thrown to the surface through the pores of the skin. This is nature's outlet for them ; and if by its healthy condition, and by our intelligent management, it is able to do its work well and promptly, these exudations are easily managed.

Of course we all know that we are covered with scales, that is, if we are not cleanly. It is like the dandruff of the scalp—with those who are too lazy to remove it. Those who properly and frequently clean their skin have few of these scales of dead scarf skin ; the surface is almost as soft and transparent and lovely as a child's.

The true skin under this is not a simple protection. Running up through it from the sudoriferous glands in the under layer are spiral, hollow tubes, which with their glands are from an eighth to a half inch long according to the thickness of the skin, and from a tenth to a thirtieth of an inch in diameter. There are more than two million of them, continually sending steam and gas to the surface in the form of sweat, and with this, effete, gummy material that is deposited on the surface. If this matter is not frequently removed it closes the pores, and is a stench. No one can disguise it, and if left long will proclaim its presence loudly, at least to the olfactories of our patients. On some parts of the body, as the palms of the hands and the soles of the feet, there are 2800 of these pores to the square inch. If the two million five hundred thousand in the skin of a grown person were put length to length they would reach more than nine miles ! But in this form they would not do the good they accomplish in their short lengths. Each with its mouth open breathes in the pure oxygen of the air, and breathes out the smoke of the internal fire in the form of carbon ; and with this carbon spits out the effete matter sent into their throats from the venous blood. We are confident the importance of the healthy functions of these outlets are not generally appreciated. Why, they are as indispensable as the proper action of the liver or the kidneys.

If by a sudden chill the mouths of these tubes become constricted, how quickly fever comes ; and much of the enervation and laziness we sometimes feel is by their being closed with this dead, gummy matter of which we have spoken.

Jump naked into a wet sheet ; have it packed tightly round you, and then quilts bound round this, till you are made a mummy ; then drink copiously of cold water and go to sleep. In fifteen or twenty minutes you will begin to sweat from head to foot, and your wet sheet will become a universal poultice, Don't be in a hurry to come out ; stay at least an hour and a half, and three hours won't hurt you. Now with lots of hot water and soap scour yourself. You never saw such a scum on the surface of the water you ever before washed in ! Where could it all have come from ? And that wet sheet ; see how perfectly covered and saturated it is with offensively smelling gummy stuff ? It can hardly be washed out. But before wiping yourself dash on cold water, and then rub hard and briskly till the whole skin glows. Ah, how good you feel now. You want to run and skip and jump. Well, this is nature's way of telling you to do it, and it is nature's proof of the sanitary good of the operation. Try it, you that have an offensive odor, and see how a few such renovations will make you as sweet as a summer's rose. Try it, you that feel dull and lazy, languid and drowsy, enervated and "billious," and see how quickly it will make you young again. Try it, you old, worthless, rheumatic, gouty, skin bound grumblers and grunters, and see how a few will straighten you out. But those, dirty, saturated, "highly scented" underclothes you took off when you entered the hydropathic pack—don't put them on again, take clean ones. Just weigh your flannels when they are clean and when you have worn them a week, and see the difference. This should convince anyone of the importance of frequent changes and frequent washings.—*Items of Interest.*

PHYSICIANS EXTRACTING TEETH—A physician writing on Mistakes in Practice, among other things says:—I never received any training in the extraction of teeth, and when a student in the office of my preceptor, I made a total failure at one time in trying to extract a tooth. That should have been a sufficient lesson to me, but it wasn't. I occasionally receive a call to extract a tooth. I do not own a pair of tooth forceps, and always send such calls to a dentist. One rainy night,

about three years ago, I was prevailed upon to visit a lady for the purpose of extracting a tooth. I was told that the friends had a pair of forceps. The truth is, I haven't confidence enough in myself to extract a tooth. I failed, of course. I then furnished my horse and carriage, gratis for the friends to take her to a dentist. Every failure, however small, cannot help but tarnish a man's professional reputation. I have not attempted to extract a tooth since, and when I do, "it will be a cold day." It is true that country practitioners must extract teeth, and I believe that that branch of *minor surgery* should be taught, practically, in our medical colleges as much as any part of the student's equipment for his future duties. A little actual practice, under the guidance of an experienced operator would go a good ways in establishing a professional reputation.
—*Items of Interest.*

THE MOST POPULAR MEDICINES.—Last month we published a table compiled by an American writer showing the comparative proportion in which twelve of the leading medicines had been ordered in 1,000 prescriptions which had been taken at random. It was shown that quinine was ordered 238 times, opium 136, nux vomica 130, iron 123, while iodine, mercury, bismuth and bromine are altogether at 59 and 60 times. In June 1868, we published an article by Mr. W. Willmott on "Medicine," in which a somewhat similar investigation is recorded. Mr. Willmott had analysed 1,000 prescriptions, but he did not give the details in a form which admits of exact comparison. He, however, found that quinine was far ahead of any other single medicine ordered, but classifying all remedies in their natural groups, he found mercury prominently at the top, then potash, bark, opium and iron. He found that out of the 768 simple and compound medicaments of the pharmacopœia, only 485 occurred at all in these 1,000 prescriptions, while three-fourths of these were not prescribed 10 times in the 1,000.—*Chemist and Druggist.*

DENTISTS DAMAGED BY THE EARTHQUAKE AT CHARLESTON.—Dr. Bull lost his residence and office by fire; saved his chair and instruments. His loss is heavy. Dr. Miles's place is so badly damaged that he will have to move. Dr. O'neil suffered great loss. Dr. J. B. Patrick had his eyes severely hurt by falling plaster. Dr. Brown's damage will amount to two hundred dollars.—*Southern Dental Journal.*

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ARTICLE I.

PROTOPLASMIC NUTRITION AND MOLECULAR
METAMORPHOSIS IN THE DENTAL
TISSUES.

BY ALTON HOWARD THOMPSON, D. D. S., TOPEKA, KANSAS.

[Read before the American Dental Association, August 5th, 1886.]

All life is evolved by and in the embryonic protoplasm,—or bioplasson or sarcode,—which, in its primitive simplicity, is the basis and matrix of all animal tissues. It is that element in all the tissues which, from its first proliferation, conveys nutrition, guides development, directs tissue-building, presides over typical evolution, and after completion of the tissue maintains the integrity of its form and quality, and carries nutriment into it and waste from it to the capillaries.

But protoplasm appears in its primitive purity in very few, if any, completed animal tissues. The complexity of organization of these various tissues is infinite, and is due to the extraneous elements, organic and inorganic, which are deposited and arranged after definite typical forms within the meshes of this primeval element of all the tissues. The

embryo during its earliest stages is apparently composed of protoplasm in its simplest combinations; yet it is impressed with mysterious powers of differentiation into specified organs from the fecundated ovum, in accordance with and obedience to typical impulse. This impulse, inherent in the ovum and spermatozoa, is the great, impenetrable mystery of life. Why all the forms of all the tissues in all their multifarious qualities and compositions should assume special shapes and characteristics and powers under the impulses conveyed by the minute cells, which are the foundation of the organism—we cannot understand, unless, indeed, we fall back upon the interference of a supernatural power above and beyond our ken.

In the evolution of the organism the protoplasmic compounds, which are first proliferated as the basis structure, select from the stream of nutrient pabulum flowing through it from the capillaries the particular elements which may be necessary for elaboration of each tissue; each protoplasmic molecule of each tissue working under its own differential impulse, whether it be building bone or nerve tissue, muscle or tooth enamel. The protoplasm then remains as a permanent element of each tissue, and gives it life; it carries in the nutriment and takes out the waste. The superior, the complex elements of the tissue are therefore dependent upon the vitalizing protoplasm, not only for creation, but for subsequent support and maintenance. The complex elements make each special tissue what it is, that it may perform its allotted work in the economy of the organism. But when the vivifying protoplasm perishes, the other elements quickly die, for through it they live and move and have their being, and perform their appointed duties.

All animal tissues which lose their protoplasm through any process of evolution or exfoliation—such as the epithelial structures—become isolated and are dead. They are attached to the organism, and have no life and exist unaltered if totally separated from it. It is still a mooted question whether the enamel, being an epithelial though calci-

fied tissue, should be classified with the vital or exfoliated products. That it is totally devoid of life throughout its substance we cannot believe, nor yet that it is vital to its periphery. Perhaps a middle ground would be most nearly the truth. That it is vital is proved by the organic areas of protoplasmic elements which have been demonstrated to exist in it when the life of the pulp is maintained ; but when this organ perishes the enamel becomes as dead as hair or hoof cut off from nourishing elements.

In applying these observations concerning protoplasm to a study of the teeth, we find that, like other tissues, the dentine and enamel have each been developed from a specially modified protoplasmic matrix, which in its earliest form is nearly pure albumen. With the mysterious impulse imparted in the formative pulps, they intelligently select from the pabulum the organic and inorganic elements required for the proper construction of these tissues, which are so wonderfully elaborated in all their details in accordance with typical commands.

Dentine seems to be much the same tissue as bone in regard to its chemical elements, but is very different in its morphology. It is formed in a protoplasmic matrix of excessive vascularity by the reduction of the supplied lime-salts in globules formed in successive capsules, which are pierced by the fibrils, around which permanent tubuli are formed. Spaces are sometimes isolated by the aggregation of globules, and in these there is often nothing but protoplasmic elements, but as a rule these interglobular spaces are filled by solid calcification. This form of calcific globules can be imitated experimentally by precipitating lime carbonate in any viscous fluid, but especially in fluid albumen, which comes nearest to the animal matrix. On the periphery of the dentine we find irregular granulations and spaces also, as the foundation for the more regular forms of precipitation. Throughout the whole tissue the protoplasmic elements persist as the living organic matrix which, by connection with the mains, the contents of the tubuli of the

dentine, the fibrillæ, which are in their turn the persistent protoplasm, conveys nutrition into the tissue and waste from it, and incidentally conveys sensation to the pulp.

The enamel is formed in a manner analagous to that of dentine but yet dissimilar in detail, as the tissues are dissimilar in chemical composition as well as in morphology. Enamel is a calcified epithelium, or at least is formed in a protoplasmic sub-basis, which is the result of a metamorphosis of epithelium. This basis is embryonic protoplasm, and within its substance is formed the tissue which is to be the inclosing capsule of the crown of the tooth when thrust beyond the gums. The salts of lime are deposited and arranged in a specified manner, according to the transmitted impulse, and in an organic matrix of horny matter,—*keratine*. It appears that there are areas of living-matter throughout this tissue,—perhaps, indeed, a reticulum of protoplasm penetrating the substance of the prisms themselves,—but at least so far as it is living-matter it contains protoplasm, and this conveys nutrition. Through this the enamel is nourished, however limited and minute this and the corresponding removal of waste may be; the main fact being that nutrition and waste are exchanged within the tissue to some extent by means of the connection of the living-matter of the dentine with the periphery of this tissue.

The power by which the movement of fluids in the protoplasm of the tissues is maintained is the function of osmosis, inherent in the protoplasm. Upon this depends the flow of fluids which create and continue life in all animal organisms,—even that highest elaboration of protoplasm called man. For, after all, animal forms are but modified sponges, which draw fluids through the meshes of their tissues to strain out the nutritive matters contained therein and, casting their waste products into the stream, pass it onward.

It is through this faculty of osmosis inherent in all tissues that continuous currents are maintained. The well-known example of an animal diaphragm separating two

dissimilar fluids which commingle more or less through this membrane, illustrates this. The membrane by a power all its own, a capillary affinity, draws the fluid within itself. That is called *endosmosis*. Then by another action—repulsion—it sends the fluid onward and outward—expels it. That is *exosmosis*. If we now carry this conception to the living membranes and tissues within the body, we will observe that they too possess this power of osmosis; that they absorb fluids—pabulum—from the capillaries by an attraction,—an affinity,—and then expel them by a repulsion equally strong, thus maintaining the currents. The change of polarity of the fluid must take place within the tissue to account for the sudden switching from attraction to repulsion.

Probably the hunger of the tissue for food causes it to draw the pabulum, and having absorbed the nutriment it craved and thrown the waste into the current, the fluid becomes offensive, and it is expelled with equal force, thus maintaining a vacuum and acting with the precision of the positive and negative poles of the magnet. This power of attraction and repulsion must vary with the vitality and density of tissues, of course. Thus, the nerve substance being more vital and vascular would require and attract more nutriment and throw out more waste, and we find this to be a physiological fact; and bone being less vital and more dense in structure would attract less nutrition and throw out less waste. By the power of osmosis we believe that the circulation of blood and other fluids of the body is aided and accelerated, and that the attraction and repulsion so exercised on the blood by the tissues is the missing link in the chain of causes inducing the movement of the blood in its circuit.

We cannot but conclude that this function is present in all tissues; that it is one of the inherent properties of protoplasm and of all its compounds. We know, indeed, that all tissues are nourished by the circulation; we know that they throw their effete matter into the veins to be car-

ried off; we know that all compounds of protoplasm possess the power of osmosis in both directions; we know that protoplasm is the basis of all tissue, and hence conclude that this element has most, if not all, to do with the osmotic nutrition of the tissues.

And so, as there is living-matter within the tissues of the teeth, and this living-matter must be protoplasm or its simple protean compounds, we cannot but assume that the dental tissues are nourished by the ever-present and ever-acting powers of osmosis. We know that osmosis, of course, begins at the capillary walls, the limit of the red blood-corpuscle's excursions, and that the pabulum is carried by that power to the innermost parts of the tissues, and that waste is carried back to the capillaries and there thrown into the veins, the sewage system of the economy. We know also that this osmotic circulation is maintained within the bones, by which the currents flow through the protean contents of the lacunæ and canaliculi, and the bone thereby nourished and the molecular changes effected even in calcific substance. We know also that this circulation is maintained in the fibrillæ of the dentinal tubuli, and that life is thereby sustained in the dentine. As the tubuli anastomose with the canaliculi of the cementum at the periphery of the dentine, and the circulation is continuous between the two tissues, we depend upon this circulation for the maintenance of life sufficient for the toleration of the tooth by the living tissues about it after the removal of the life-source of the dentine, the pulp. We expect it to preserve not only the life of the cementum intact, but also to maintain some vitality in the dentine in contact with it.

But further than this, it has been conclusively demonstrated that there are areas of living-matter in the enamel, and that this living-matter is in direct connection by an anastomosis more or less regular and continuous with the contents of the dentinal tubuli. If this be true, then indeed there is osmosis by which nutrition is conveyed to the enamel, however minute and inappreciable it may be.

If this circulation exists by the inherent powers of osmosis in the protoplasm or protean organic elements of the dental tissues, then we must hold that molecular change is possible within limits that could make such change appreciable. If the tissues can be fed and their waste products carried off by this osmosis, then must molecular change be possible in the dental tissues as in other tissues, through physiological variations within health-limits; but especially in favorable pathological conditions of the circulating fluids would these tissues be subject to alterations.

A few of the ordinary evidences of this alteration might be cited in illustration. First, it is well known that the teeth at eruption are not so dense in structure, so rich in inorganic elements, as at maturity. Again, this density usually increases with age and active employment, so that the dentine of old age and the dentine of adolescence are very different in quality. The former is nearly devoid of protoplasm, and the very fibrils become calcified to some extent, and often the pulp itself; while the latter, though morphologically perfect, is very incomplete chemically, and possesses a large quantity of mere protoplasm, which will need to be calcified before the dental tissues will reach their mature texture.

And if this calcification can take place after the tooth is erupted and morphologically complete, we must believe from analogy that the polarity can be reversed and *de*-calcification be possible under the incitement of pathological conditions. Even physiological change of the circulating fluids, such for instance, as occurs in pregnancy, induced perhaps by lime-starvation, may cause molecular change, for we have reasons for believing that lime is taken from the teeth and bones for the construction of the osseous system of the foetus, and that it is returned after this function is completed. Indeed, the molecular disturbance of the entire system is very great and very appreciable, physiological activity everywhere being accelerated during the continuance of the creative function. And after this, during

lactation, there is also disturbance of a somewhat different kind, a lactic prevalence and a draining of the system of its general food stores when the required lactic elements are not supplied by the digestive and assimilative powers in sufficient quantity to meet the excessive demand. In both conditions a molecular breaking down occurs, and the resulting food is appropriated by the growing child.

Again, we know that the teeth of patients which have been in good, dense condition for years, requiring very little treatment at our hands, will suddenly and often without apparent cause take on a condition of unaccountable softening, and caries will progress with uncontrollable rapidity. What it is that causes this remarkable change, what it is that acts through the circulating fluids to disintegrate and carry off the lime-salts, we do not know. But it is a molecular change of some sort,—a retrograde metamorphosis which stimulates a return to the embryonic condition,—a breaking up of molecules for *re*-formation of elements which may have a density as food to other parts of the system, or it may be to form purely waste products.

Molecular metamorphosis is at once the wonder and mystery of modern physiology. Recent investigators have completely revolutionized our ideas of even such simple things as the digestion and assimilation of foods. "The older physiologists assumed that the flesh of the meal was directly, without great effort, and without much change, so far as the chemical composition is concerned, transformed into the muscle of the eater. The researches of modern times, however, go to show that the substances taken as food undergo many changes and suffer profound disruption before they actually become part and parcel of the living body, and conversely, that the constructive powers of the animal body were grossly underrated by the earlier investigators. If we were to put forward the claim that the proteid of the meal becomes reduced almost to its elements before it undergoes synthesis into the superficially similar proteid of muscle, the energy set free in the *destruction*

being utilized in the subsequent work of *construction*, we would not anticipate modern research but for a brief time, for it would almost seem as if the qualities of each particle of living protoplasm were of such individual character that it had to be built up fresh almost from the very beginning. The problems of physiology in the future will be largely concerned in arriving, by experiment and inference,—by the mind's eye and not by the body's eye alone,—at a knowledge of the molecular construction of this protean protoplasm, of the laws according to which it is built up, and those by which it breaks down; for these laws when ascertained will clear up the mysteries of the protean work which the protoplasm does. All over the body the protoplasm is constantly building itself up out of the pabulum supplied by food, and continually breaking down, giving rise to different tissues and combinations in different parts of the body, with different compositions and different properties, the various activities of the body being the outcome of the various properties of the various combinations. If this be true, it inevitably follows that protoplasm cannot be the same everywhere, but that there must be many varieties of protoplasm with different qualities, and with correspondingly different molecular structure and composition.”—*Michael Foster*.

But as to this molecular metamorphosis in the substance of the tissues,—both constructive and destructive, progressive and retrogressive,—we cannot yet witness its methods, but only its phenomena. “We are taught by physiologists that there is a constant splitting up of the molecules of which the body is composed. This breaking up is accompanied in health by corresponding building up of tissues from the food after assimilation. For instance, the bones lose their phosphate of lime to which they owe their solidity, the salt passes into the blood and is there eliminated by the kidneys. The brain also loses phosphorous. Now, the food should, if appropriated and duly assimilated, supply an abundance of the phosphates,—ample, indeed, to bear the strain imposed

upon the phosphorous resources of the body. But this supply being insufficient, or digestion or assimilation being imperfect as regards the phosphorous salts, a phosphorous famine begins and the body feeds upon itself and consumes its own phosphorous. So a general malnutrition may react upon any specified parts of the organism by abducting its constituent salts, albumen or other matters, and thereby lessen its resistive power to disease; and the teeth are organs peculiarly liable to suffer from this general malnutrition, inducing a chronic starvation, and by lowering their vitality and robbing them of much of this reserve store of materials render them more liable to caries."—Ed. *British Journal of Dental Science*.

Molecular metamorphosis is the cause of every act and process of nutrition and removal of waste. Indeed, it is certain that a "wasting of its tissues" is wasting,—a removal of integral parts by molecular breaking down, but the expected replacement does not follow. In certain diseases assimilation and molecular construction seem to be held in abeyance, while breaking down and waste still go on, either normal or abnormal, and in other conditions again waste is lessened and construction goes on, with corresponding increase in the quantity or density of the tissue. These operations we observe in the dentine, and perhaps they take place in the enamel. As there is nutrition and waste by osmotic currents in these tissues, there must be molecular change in accordance with general law. The teeth cannot be exceptions to a rule among vital tissues in this regard. These can be waste of the inorganic elements of the dentine and probably of the enamel, and when this removal is not followed by compensating reconstruction of lime phosphate molecules, softening of these tissues results, with corresponding lessening of resistance to the attacks of caries. Then, again, there may be increase of density, as transpires with age, by a more rapid construction than waste. If molecular progression and retrogression are continuous in normality, then is metamorphosis omnipresent in the dental as in all other tissues.

ADDENDA.

In the condition known as inflammation in the dentine, we have a molecular activity which seems to be a breaking down and removal of lime-salts, then of its organic matrix, and then in healing a reconstruction of both occurs. "Inflammation causes solution of the lime-salts, and afterwards a liquefaction of basis-substance, both in bone and dentinal substance. The result will be the appearance of globular spaces, a bay-like excavation, which, instead of being filled with basis-substance, exhibits medullary corpuscles multinuclear protoplasmic masses, corresponding to the embryonal stage of the tissue . . . Suppuration may result, but far more common is the healing process of eburnitis, the results of which may be seen in the formation of dentine closely resembling secondary dentine, or a dentine destitute of canaliculi,—osteo-dentine."—*Heitzmann and Bodecker*. What this inflammatory condition is we will not stop to consider, but it will suffice for our purpose to direct attention to the intense molecular activity that takes place, the breaking down and then total removal first of organic and then of inorganic elements, and then the following of molecular synthesis, by which the basis-substance, as well as the calcified elements, is reproduced again. Here is a molecular work which cannot for a moment be doubted, and, while we observe its operations with wonder, we cannot but regret that the mystery of its *modus operandi* is yet impenetrable.—*Dental Cosmos*.

ARTICLE II.

PROFESSIONAL COURTESIES IN CONNECTION
WITH WHAT ARE COMMONLY CON-
SIDERED FAILURES IN DEN-
TAL PRACTICE.

BY C. E. FRANCIS, D. D. S., NEW YORK.

The course of human effort seldom runs smooth, and the daily routine of life is checkered by varied experiences that denote a perpetual contest between fortune and fate.

An ancient proverb declares that "All creatures are victims to circumstances," and certain it is that to a large extent circumstances frame men's opinions and govern their actions. And likewise do circumstances revolutionize established ideas, modify fixed methods and vary the ever-flowing currents that sweep the shores of prosperity or adversity. Inclination may suggest enterprises which adverse circumstances render difficult or impossible to execute, and tasks undertaken with fair hopes of success often terminate in failures and disappointments. Unforeseen contingencies possibly arise; unfavorable conditions appear; opposing influences prevail to frustrate earnest efforts or disappoint reasonable expectations.

A dentist's experience is exceedingly varied and beset with numberless difficulties, perplexities and trials. He may be ever so skillful in the dental art and possess the requisites that especially fit him for his calling, yet he cannot invariably overcome impending obstacles, nor count on uniform or absolute success. No man is infallible, however he may boast, for infallibility is not a human attainment. Failures occur in all quarters, and every mortal has a proportionate share of them. If individuals see not their own imperfections, perhaps others do, yet occasional ill success does not indicate absence of manipulative ability, nor a total lack of talent or genius.

It is well to hesitate before condemning operations that our neighbors have performed, for it is possible that no better results would have followed had like tasks, under similar circumstances been attempted within our own doors. Before hurling offensive missiles at others, it may be wise to consider if the fortifications erected for our own shelter are not citadels of glass.

It is unfair to judge harshly from a failure observed, and to gauge its author accordingly, for perhaps other operations from the same source might exhibit evidences of marked skill and sound judgment. Unfortunate it is, that some individuals are too ready to pass unfavorable

comment upon the works of others, especially if in the least degree faulty, without possessing sufficient generosity to credit them for achievements that are eminently successful, and that bear the stamp of excellence.

It would almost seem as if in every trade or profession certain members imagine that the only possible way of gaining a reputation for themselves is in undermining the reputations of other members of their calling. In efforts to reach the goal of fame they would make stepping stones of their fellows, and do them injury at every tread. Sensible people, however, are not unlikely to distrust those who speak uncharitably of their compeers, and it frequently happens that ungenerous comments reflect unfavorably upon parties who utter them.

When dismissing our patients, we are not always sure that they will return to us for future treatment. In the course of time many will get into other hands. Some remove to distant localities, and find it inconvenient or impossible to come again. Others, by nature, are inclined to wander and are fond of making changes. Some change with a view to economy; others, perhaps, from lack of confidence or a fancied neglect. Some fail to return because bills for former operations remain unpaid, and such parties are usually ready to misrepresent or malign those whom they have defrauded.

Many an excellent and faithful dentist has been declared the author of discreditable operations which he never performed. Many have been charged with having inserted fillings (with assertions that they soon after "fell out,") in cavities that had never experienced the touch of a dental instrument! The decay and destruction of entire dentures, resulting from sheer neglect and carelessness on the part of those who possess them, are often charged as mal-practice on the part of some dentist who, perhaps, simply introduced a single filling, or removed beds of calculus and polished the stained surfaces of enamel.

"Your dentist has shamefully neglected your teeth and

allowed them to go to destruction ;" remarked a New York dentist to a lady, who, in emergency, called upon him with a request that he would quiet the rebellious demonstrations of an aching bicuspid, which, however, he failed to accomplish. Could this man have known the history of the case, he probably would not have ventured on so untruthful a statement. Fortunately, the lady rebuked him for the unjust insinuation.

To take for granted all that comes to our ears from disaffected or grumbling visitors is neither wise nor just, and certainly "fuel should not be added to the fire" by sympathizing with their complaints or endorsing their scandal.

There are various ways of doing injustice and injury to our neighbors, even without charging them with incompetency or denouncing them as charlatans. A feigned look of astonishment when scrutinizing their work, a significant shrug of the shoulder, or a disapproving shake of the head, will have the effect of undoing confidence in the operations of their former dentists, and sometimes prove even more damaging than open denunciations. To ask if the doctor was not in a hurry when he filled their teeth—if the doctor *himself* performed the operations—if the work was not done by his student—if the doctor's eyesight is not failing him, etc., are insinuations that excite suspicion, and convey the idea that operations have been slighted. Nor does it make things smoother to add in a semi-apologetic manner that "the doctor was considered a pretty fair sort of a dentist *once*, but unfortunately he is getting old." All this is needless, and generally uncalled for. It inflicts injury on those to whom such references are made, and fills with distrust the minds of those who have received their attentions. And to sum up, no good whatever can result from such ungenerous criticisms.

The causes that tend to failures following dental operations are many, and when duly considered, it seems a wonder that there are not more of them. Very many individuals

defer their visits to the dentist until driven by dire necessity to seek relief from pain, and it is then found that their teeth are in a sad plight. Some cases present large approximal cavities, or crowns so decalcified and broken down that reliable walls for the retaining of fillings can hardly be secured. Exposed pulps, congested pulps, dead pulps and alveolar abscesses, also manifest their presence; and yet it is often expected that such dilapidated and diseased organs can be so restored that they will promise even better than before they became so wretchedly neglected or abused.

People who are so wilfully careless and negligent concerning the preservation of their organs of mastication are not entitled to a very great degree of sympathy if trouble ensues. Some sufferers seem to obtain a little grim satisfaction if they can only saddle the responsibility of their mishaps upon others, and their dentist is, in some instances, a very convenient scapegoat on whom to work their saddle. When discontented parties come to us with their complaints, it is clearly our duty to vindicate the good standing of our *confreres* as the occasion offers, and at the same time remind our visitors that personal interest and vigilant care on their part is requisite, if they expect to escape consequences that neglect is apt to engender.

A few days ago a letter came to me from Dr. Quinby, of Liverpool, in reply to a communication previously addressed to him concerning one of his patients, who, when on a recent flying trip to this country, called on me for a little personal attention. The doctor, in his letter, pictured the patient to a "bird of passage," who never thinks of treating his teeth to any sort of attention until just ready to start for some distant clime, then allowing such limited time for treatment that they cannot be properly cared for. Dr. Quinby also adds: "There is no satisfaction in trying to do anything for men who do not take an interest in their teeth themselves—men who try to make a sort of a father-confessor of their dentist, getting absolution from him once a year, and throwing all their sins of omission and commis-

sion on his shoulders." Here, gentlemen, you have a comprehensive essay in a few words, and from a fellow practitioner whose utterances are noted for wisdom and sound sense—a gentleman who well understands the difficulties that his fraternity have to contend with, and who is ready to sustain and defend them at every point.

And now, fellow practitioners, let us do justice to others as we would wish justice done to ourselves, and may we never forget that professional courtesies of every sort are much like "bread cast upon the waters," rewarding us with happy reflections, and inducing a reciprocation of kindly courtesies, with the hearty good-will and esteem of our professional brothers.—*Independent Practitioner*.

ARTICLE III.

REQUIREMENTS OF TEETH EXTRACTION DURING THE PERIOD OF YOUTH.

BY J. HARDMAN, D. D. S., OF MUSCATINE, IOWA.

The life period of the human is divided into infancy, youth, adolescence and old age. Each of these periods have attending conditions more or less specially marked as individual characteristics belonging to it.

While viewing this question from a general stand-point, the anatomical and physiological structures and functions are found to be in strict harmony with each epoch. The infant has the organism of the growing child; the youth of structural change from infancy to adolescence—adolescence manifesting the full acme of complete manhood; while old age is attended with its marks of decline towards a final close and dissolution of all that went to make up the individual's organism during a lifetime.

The relative diversity in each of these periods, in a general way, is not more marked than they are in a special

way. The oral conditions, odontologically considered, are as manifest in their variations throughout life as are the general parts of the being; and hence, as the general treatment is intelligently varied and adapted to suit and correspond to the attending age and conditions, it must follow, ergo, that oral or dental treatment must also agree in kind and variation suitable to each period of the patient's life or stage of development.

While the question as to how extraction of teeth should be conducted in each of these other divisions, as well as this one of youth, would be of much interest to dental readers, it is obvious, however, that time or the needs would not at present justify such consideration.

I perceive that the most obvious defects in treatment by needful extraction is more generally prevailing in the profession at this day in patients belonging to the class properly known as youths than any others. I have, therefore, taken this period of life upon which to advance some suggestions. I am aware that some very deserving operators wholly pronounce against extraction as being proper, or required, under *any* circumstances; but, as such advocates are obviously in error, and are yearly growing less in numbers, we conclude there is no need in taking up time in attempting a refutation of their position.

We concede that correct practice will seldom prompt the intelligent operator to remove a tooth or teeth *simply* on account of odontalgia, but because *some other attending condition or conditions demand it*; and some of these attending conditions during youth is what we propose now to consider.

In starting out we must not overlook the fact that everything in such a mouth is yet incomplete and in a state of formative development. The maxillæ are yet expanding; the teeth not fully emerged, and are in a state of incomplete development; the jaw contains more teeth in a state of growth than at any other stage of life; greater sensibility of the entire system prevails, and the patient less qualified

to properly care for the teeth, besides many other conditions peculiar to this age that might be mentioned, as sedentary school life, age of puberty, unusual demand for tooth material, etc.

The intelligent practitioner should highly estimate the value that judicious extraction has in this period in preventing and correcting irregularity. While he justly values the worth, and often effectual influence of appliances and means towards expanding and modifying the dimensions of the jaw during this period, and even during adolescence, yet in many cases judicious extraction has greatly the preference in effectiveness, in time, in ease of accomplishment and in expense. It has been fairly accepted as an axiom that the patient may have inherited the small maxillary of one parent and the large size of teeth of the other, and *vice versa*. Hence the deformities of frequent cases of irregularity, of extreme pouching and of over-crowding, are resting upon a natural basis. Any effort to correct any of these evils by appliances, while still retaining all the teeth, is liable to prove a certain failure.

1st. The endurance of the patient to wear such appliances sufficiently constant and protracted, is seldom found.

2d. When accomplished, the constant tendency of nature to reassert its primary principle is very certain to re-establish the same prior conditions—not typical of a complete morphology of a race, but such as was transmitted from parents to the child.

3d. Where irregularities in jaws thus small and of over-sized teeth are attempted to be overcome by a mechanical expanding force, the effort amounts generally only in protruding outwardly the points of the teeth, giving a malposition of the true perpendicular axis of the teeth, causing the force of mastication to come *not* perpendicularly upon the end of the tooth, but obliquely, pushing outwardly, thus greatly lessening the strength and power of the teeth in service, also inducing a disgusting outward projection of the teeth, with facial deformity and early loss of gingival support.

A judicious thinning out by the removal of one or more teeth, at an opportune time, will generally effectually accomplish the greater amount of good, *immediate and remote*, than can be done without extraction. Of course other means must not be eschewed, as they furnish in many cases important and very efficient aids.

It is not infrequent that we meet one or the other jaw greatly protruding, caused alone by this great disproportion of maxilla and teeth, more frequently the upper. Here the removal of a tooth or two, upon each side of the protruding jaw, will often accomplish wonderful corrective change, both as to symmetry of outline and of usefulness. Again, where this hyper-dental condition is attended with great tendency to caries, a thinning out is imperative, especially if at the same time other demands call for extraction as a remedy and the teeth are crowded in the jaw.

In extracting for any of the foregoing causes, I should, other things being equal, prefer the first bicuspid, next the second bicuspid or first molar—always making an exposed, diseased or dead pulp, or a suppurating tooth, a leading cause to mark the doom of the tooth.

Next we wish to call special attention to the frequent necessity to remove the first molar some time (early) during the period extending from the time this tooth is emerged and the emerging of the third molar, a period well marking the limits of this age of youth. Whenever the pulp of this first molar is exposed, or if it is dead at this age, and especially if the second and third molars are not missing, *treat by extraction*. To settle this our way, we would say, extensive anticipated physiological changes in adjoining parts, as well as pathological conditions of the tooth itself, must exert a large influence in treatment.

The immature state of the tooth, the absolute need of pulp influence, the changes of position in consequence of the coming second and third molars crowding for place—these go far to disqualify this tooth for usefulness and susceptibility of treatment *after* nerve exposure. We think we

are safe to say, that where in this tooth a nerve is capped or devitalized, or where the root membranes are suppurating, and this tooth filled any time prior to the emerging of the dens-sapientia, the sequel will prove a failure. Not one in fifty will remain in a useful state at the age of twenty-five. But, the rule will be deterioration ; that amounts to disintegration, passing generally into alveolar abscess, and the finale, quite certain, will be the removal of the tooth. It is hardly necessary to say that the loss of nerve influence in cutting off the further supply of mineral and other tooth elements so much needed in this immature tooth, cannot be expected to be supplied through the peridentium. It absolutely requires *nerve* (or pulp) influence to carry on the deposit of tooth element ; that where this is cut off, there is an end to further development of this kind. The tax upon vital energy, while the struggle for position and development of the second and third molars will be too great, and pathological action is established, that generally ends in the suffering patient yielding to removal. Where this tooth is removed some time before the emerging of the third molar the second, and finally the third, will gracefully and certainly shift forward and close up the space, securing an excellent tier of grinders and the concentration and conservation of increased vital energy to the third molar, making that a well matured and permanent organ ; while upon the other hand, an attempt to save a first molar already in this condition will surely entail unremunerative expense and prolongation of suffering. Despair comes, though sometimes late, but only too sure ; the tooth is extracted *after the emerging of the third molar and a permanent gap is the sure result, with the third molar deficiently developed, badly crowded back and out of useful range, of but little service and short life.*

The statement by some, that the early extraction of this tooth is followed by a forward dipping position of the second molar, and also of deformity by favoring malformation of the maxillary bones, etc., we can but regard as merely

fanciful. The former is much oftener the result of *too late* extraction when it does occur, and the latter is more generally prevented by the loss of this tooth in season, producing improved physiognomic contour rather than damage, as indeed the attempt to save the one is likely to sacrifice the two. The plan and recommendation of removing the entire first four molars, where one is past salvation, in order, as it is claimed, to secure and maintain perfect articulating antagonism, is, in my view, bad philosophy and reprehensible practice. By close observation in hundreds of cases where but one of a jaw was removed, we have found nature come to the rescue, and with such complete restitution that we can but regard the wholesale extraction of sound teeth in this case, and alone for this purpose, as erroneous and ill practice.

My observations force me to the conclusion that capping the nerve, under *any* approved plan, will prove a failure in this tooth any time before the third molar is developed; and if the nerve is devitalized, no mode of root or crown-filling, along with the best therapeutic treatment, will carry the tooth even to adult age and then be worth one-half what it cost in suffering and disappointment; and if persevering endurance has it in possession at this adult age, ninety-nine chances to one it is more or less a nuisance and will not be tolerated but a limited period, and then its removal be followed by a permanent gap, with very certainly an imperfect third molar of little service to the possessor.

We have thus confined our consideration of the needs of extraction of teeth, during youthful age, to the prevention and correction of irregularities, and to the good influence correct and timely extraction may have in the management of the molars. This, of course, cannot cover all the cases that a judicious use of the forceps should serve in the varied rounds of daily practice. The vestiges of the deciduous set, as relics of the infantile epoch, may need the forceps to aid where deranged or perverted nature has not normally completed its work. One or more stray temporary teeth

will occasionally be found to persist in "holding the fort" long after their proper and typical leases have expired, the roots still remaining and obstinately opposing or deranging the status of the coming permanent teeth. Here, as a rule, extraction should come to the aid, and, as a dernier umpire, settle the question by ousting the tenant whose claims by limitation have been foreclosed. The tardy, deciduous tooth may give a mal-direction to the permanent that will be irremedial and compel the loss of the latter, if not worse consequences.

While I would severely rebuke the stupid and unprincipled slaughterer of teeth by wholesale extraction for the mere object of catering to the false fancy of the ignorant patient, or to satisfy the greed to make money upon a low grade of practice and morals, I would wish to impress upon the minds of the deserving and honorable practitioner the true rationale of *not* sparing the forcep where it can so truly and effectually prevent or correct the irregularities or malformation, and especially in the treatment of the molars and bicuspid in youth—*never to devitalize a pulp of a first molar, or a tooth near by*, while the crowding for position of coming teeth still exists.—*Dental Luminary*.

ARTICLE IV.

SURGICAL DISEASES OF THE TONGUE.

BY H. A. SMITH, D. D. S., CINCINNATI, OHIO.

All along down from the first records of medicine the appearance of the tongue have been studied in connection with morbid conditions of the system. Its appearance in health and disease, if properly studied, would often enable us to advise our patients as to whether the peculiar appearances presented are due to local conditions present in the

mouth or to sympathy with the alimentary canal, or perhaps with other parts of the system.

The tongue, situated as it is in the floor of the mouth, is surrounded by the teeth. These, if healthy and intact, form a protecting wall to shield it from harm, but if diseased or broken down they become the veritable cause of a variety of diseases of the tongue.

In this connection we may mention *parasitic affections* of the tongue. While animal parasites are rarely found on the tongue, it may safely be said that no tongue, however healthy, is free from *vegetable* parasites; and yet Butlin states that there is but one disease, so far as he knows, due to the presence of a vegetable parasite, namely *thrush*, a membranous disease not only of the tongue, but of the inside of the mouth generally. The disease depends upon the presence of a fungus (*oidium albicans*), which is identical with the *oidium lactis*, the ferment of the acid fermentation of milk.

These two parasites being morphologically alike, we should expect to find in the mouths of children who are attacked with thrush after the teeth begin to erupt that caries would be more prevalent with those who are fed with a spoon than those fed with mother's milk. In children artificially fed the mouth shows more constantly an acid reaction. In the act of sucking the saliva is secreted in larger quantities, and being alkaline, the acidity of the fluids of the mouth neutralized to a degree not found in children fed with a spoon.

The condition called *furred tongue* was formerly regarded as nearly always a sign of disease; variation in the extent and color of the coating indicating the particular form of disease.

Greater weight must be given these appearances in diagnosis of disease if we consider this deposit of fur as proceeding from a secretory process of tongue itself (Wood) than when we accept the modern view that fur on the dorsum of the tongue, whether in health or disease, is essen-

tially a growth of fungus (chiefly of micrococcus and bacillus subtilis), and that the epithelium and food debris usually present are unimportant and accidental constituents (Butlin).

The vegetable spores found in the fur are deposited in the filiform papillæ of the tongue from the food taken in the mouth, as well as from the inspired air, and finding a favorable habitat the germ grows with surprising rapidity especially at night when the tongue is comparatively still.

Frequently the tongue is prevented from being cleansed in the natural way by the absence of one or more teeth on the side of the mouth. by the roughened surface of a tooth, or the presence of diseased teeth that are sore to the touch, thus preventing sufficient movement and friction against the teeth to cleanse the tongue. If a person eats on one side of the mouth, the tongue on the opposite side will show more or less furring. Mr. Hilton attributes this furring of the tongue to disturbance of function and nutrition by reflex action through the influence of the fifth nerve. But, as Mr. Hutchinson remarks, most of these examples of unilateral furring may be explained by mechanical action.

The tongue is subject to quite a variety of ulcers. Of the traumatic variety, those that are caused by the teeth wounding or irritating the tongue frequently come under the care of the dentist. Unless the patient is subject to chronic glossitis, these simple ulcers are speedily cured by removal of the cause of the disturbance, a very simple operation frequently, as by carefully smoothing the jagged edge of the tooth or by extraction.

Ulcers which form on the under side of the tongues of children attacked by whooping cough, and which are supposed to be a specific lesion of the disease, may be, we think, explained by the irritation caused by the rubbing of the tongue against the lower teeth during the paroxysms of coughing.

Aphthous ulcers are frequently met with upon the tongue and mucous membrane of the mouths of adults, but

they are more common in children ; and it is still a moot question whether or not the disease is contagious. If a specific parasite is always present in aphthous ulceration, then it is possible for a dentist, unless proper antiseptic precautions are observed, to convey the pathogenic germ from an aphthous patient for whom he has operated to the mouth of another susceptible patient.

Among the exciting causes of *cancer* of the tongue usually mentioned by writers are bad teeth, coarse, hot and highly spiced food ; the constant friction of the mouth-piece in using a tobacco pipe, chewing tobacco, and the injudicious use of caustics in treating sores on the tongue (Butlin).

The relation of the disease to age and sex is somewhat striking. Statistics show that it is hardly known in young adult life, while it is quite common between the ages of 40 and 70.

We have mentioned the irritation caused by jagged edges and rough surfaces of the teeth as a cause of cancer of the tongue, and it may be noted in this connection that the teeth during the period of life between 40 and 70, if neglected, are most likely to take on the conditions tending to injure the tongue. To the hard usage and greater neglect to which the teeth of men are subjected, we may, in part, attribute the marked frequency of carcinoma in males over females. Baker, who gives a record of 293 cases, states that of these only 46 were females.

Another explanation of this difference in the liability of the two sexes to cancer of the tongue, is that women are not given to drinking, smoking and chewing, as are the men.

Carcinoma may attack any part of the tongue ; but the fact that it is most frequently seated in the parts in contact with the teeth, emphasizes the importance of giving attention to these organs in diagnosis of this disease.

The question whether or not the habit of smoking predisposes to cancer of the tongue, is now frequently asked. Butlin says : " There is no evidence with which I am ac-

quainted which will prove that carcinoma is really much more common among adult males who smoke than adult males who do not smoke." Yet I think it not improbable that smoking does to a certain extent predispose to the disease.

Diagnosis of lingual cancer is rendered quite difficult, because of the resemblance of syphilitic ulcerations, of tubercular ulcerations, of fissures of the tongue, and sometimes of simple ulcers, to carcinoma; and moreover, the difficulty is increased by the fact that certain of these diseases are transformed into carcinoma by almost imperceptible graduations.

In all doubtful cases the microscope is the most valuable and reliable aid to diagnosis.—*Dental Cosmos*.

ARTICLE V.

MAN'S LOST INCISORS.

BY BERTRAM C. A. WINDLE, M. A., M. D., DUBLIN,

AND

JOHN HUMPHREYS, L. D. S. I.

[Read before the British Association and the Central Branch of the British Dental Association.]

Teeth beyond the ordinary number may occur in the incisor portion of the dental series, and fall, when present, into two categories—*supplemental*, that is, incisiform, though generally smaller than the normal incisors, and *supernumerary* or conical teeth, which do not conform to the shape of any other member of the dental series in man. These teeth have been described by various authors, the following being a resume of the literature of the subject. Eustachius states that he has observed two cases of supernumerary teeth, and cites Alexander de Benedictis as having also seen such. Meckel observes that they are more common

in the front and in the superior maxilla, and that they differ from the normal teeth in size and shape, being smaller and conical. Generally only a few, as many as eight, have been noticed in each maxilla. This was probably a co-existence of both dentitions. Hunter believes these teeth to be always incisors and canines, whilst Owen goes so far as to state that he has never seen a supernumerary premolar or molar. Wedl gives a lengthy account of both classes of superfluous incisors. The co-existence of six teeth, two being supplemental, in either jaw he considers to be rare—one extra supplemental tooth being more common. Turner has described a case of a slender, conical, supernumerary tooth, situated in the interval between the two upper central permanent incisors. Supernumerary teeth are placed either amongst the permanent teeth or behind them and within the alveolar arch. Their eruption takes place during the first or second dentition, or in the interval between the two; generally, however, they belong to the permanent series.

Baume's interesting remarks upon the subject may be summed up as follows:—The incisive region having formerly contained more than the present number of teeth, it is not strange to find superfluous teeth in various parts of the os incisivum, as the enamel organ, ordinarily abortive, may assert itself and revert to the primitive type. When this occurs, the teeth seldom reach the highest degree of development, as shown by their conical shape. Granting the loss of incisors, in which part of the series does the deficit occur? The Apes have lost a tooth in each incisive bone since the Tertiary period. These animals possess a diastema behind the lateral incisor, which at first sight might appear to point to this spot as the site of the missing tooth. This theory, however, falls to the ground from the fact that animals possessing the full number of six incisors have also a diastema in this position to allow room for the large canine. Baume believes that the medium incisors are those which fail to appear. Amongst the Prosimii and the Cheiroptera, he goes on to say, there is normally a diastema in this posi-

tion, and this may also be found sometimes in Apes and even in man, though in the latter the width never appears to exceed 2 mm. This separation is more common in the upper than in the lower jaw. Here may sometimes be found superfluous teeth, and here once Baume noticed two excessively small conical teeth co-existing with those normally found.

Dr. Edwards, of Madrid, in a paper entitled "The Missing Incisors in Man: Which are they?" arrives at a similar conclusion to Baume, and on somewhat similar grounds.

On the other hand, Professor Turner, in a paper on "The Relation of the Alveolar Form of the Cleft Palate to the Incisor Teeth and the Intermaxillary Bones," adopts the theory that the missing incisor is the second, In_2 . His remarks on this vexed question are of such importance that we reproduce them at some length:—

"Not only," he says, "is six a very common number of upper incisors in various mammals, but as is well known to dental surgeons, three incisor teeth are sometimes developed on each side of the human upper jaw when there is no alveolar cleft. I have now before me the casts of two otherwise normal palates taken from different persons by Mr. Andrew Wilson, L. D. S., one with the milk, the other with the permanent dentition, in each of which six upper incisor teeth have been developed. The question therefore naturally arises which of these teeth is suppressed in the normal incisor dentition in man? Some light is thrown on this question by these cases of alveolar cleft. In the cases of double cleft with two incisors in each half of the projecting intermaxillaries, these teeth would be in dental rotation In_1 , In_2 , whilst the precanine would be In_3 , but in many cases of alveolar cleft, more especially when it is one-sided, only one incisor tooth exists between the mesial suture and the cleft, whilst a precanine is present on its outer side. The precanine, as in the preceding example, would be In_3 , whilst the incisor situated mesially to the cleft would be in

the majority if not all of the cases without doubt In1; the suppressed incisor, therefore, would be In2, and it is not unlikely that in normal human dentition the incisor which does not develop is also In3. This view of the homology of the precanine tooth and of the normal lateral incisor, viz., that it is In3, is also advocated by Dr. Allbrecht. Dr. Th. Kolliker, however, has not apparently formed any exact conception of its homology; for although sometimes he refers to it as In3, at others he speaks of it as if it represented the ordinary lateral incisor, which incisor he obviously regards as a different tooth from In3."

This view as to the position of the suppressed tooth is also shared by Mr. Andrew Wilson.

Before proceeding to describe our cases and to make any remarks thereon, we desire to state that we lay but little claim to originality in the theories which we put forward. On the other hand, we believe that the questions which we shall pass in review deserve a more systematic examination than has yet been accorded to them, and that the specimens which we have to describe will in some instances afford additional confirmation, in others throw a new light on the actual facts.

Our specimens have been for the most part obtained by ourselves from the clinique at the Birmingham Dental Hospital, the large number of patients attending at which affords an excellent field for the observation of dental abnormalities.

We have also to express our acknowledgments to the following gentlemen for kindly supplying us with specimens from their collections: Dr. Crapper, of Hanley; Messrs. Chas. Sims and Adams Parker, of Birmingham; Mr. Percy May, of London; and Mr. J. S. Amooore, of Edinburgh.

We have arranged the teeth into eight series:—

Series I. *Supplemental Teeth*.—In this group we have one case of six separate incisors and one of six, the two central being geminous. In both these cases the teeth are in regular series. We have seven in which there were five

incisors, in three the additional tooth was on the right side, in four on the left. In all the cases save one they were situated behind the true lateral, generally occasioning some displacement. In one case, however, the intruder was placed between the lateral and central; one case only belonged to the milk dentition, and all were found in the upper jaw.

Series II. *Supernumerary Teeth.*—We have four casts in which there are two of these teeth. In two of these the teeth were situated behind the median incisors; in another one was posterior to the left lateral and a second between the right median and lateral. In the fourth one was posterior to the right central, and the second lay between the two median.

We have fifteen cases in which there was one supernumerary; these teeth were situated inside the alveolar arch posterior to the left median incisor in seven cases, the right in five, and in the middle line in three instances. They generally caused more or less displacement of the remaining teeth. All were found in the superior maxilla and all belonged to the permanent series.

Series III. *Co-existence of supplemental and supernumerary with the normal number of incisors.*—Of this we have one specimen. In it a properly-formed though small incisor is placed behind the right lateral and in series with it, and a blunt tooth posterior to the left median which it displaces forwards. This occurred in the superior maxilla, and belonged to the permanent series.

Series IV. *Substitution of a supernumerary tooth for a normal incisor, the number remaining four.*—Of this we have four specimens. The substitution was one each for the right and left median, and twice for the left lateral. These cases belonged to the superior maxilla and the permanent dentition.

Series V. *Substitution of two supernumerary teeth for normal incisors, the number of teeth remaining four.*—Of this we have six cases, the two lateral incisors being invariably those to suffer.

Series VI. *Absence of one incisor, the number being three.*—In two cases the right lateral (superior) incisor was wanting, and in one the same tooth in the inferior maxilla. All these cases belonged to the permanent series.

Series VII. *Absence of one incisor, diminution or malformation of another, the number being three.*—Of this we have four cases. In two the right lateral was absent, and of these in one case the left was conical and in another small but incisiform. In two the left lateral was absent; in one of these the right was small and incisiform, in the other it was conical. All these belonged to the superior maxilla and permanent dentition.

Series VIII. *Absence of two incisors, the number being reduced to two.*—Of this we have eight cases, of which seven belong to the superior maxilla and all to the permanent series. In all, the laterals are the missing teeth. The jaws are generally well formed, and there are often gaps between the teeth in the incisor region. The ages of four of these patients were respectively 21, 22, 22, 17; of the others we have no exact information, save that they were adults. The eighth case is especially interesting, firstly, as belonging to the inferior maxilla—a rare occurrence, and secondly, as it was found in the same individual as one of the cases in Series VII. In this individual the superior maxilla contained three incisors, one being conical, the inferior only two.

We shall now proceed to discuss in order the various points which a consideration of these series raises:—

1. *Man's original dentition included six incisors.*

The consensus of opinion that man formerly possessed six incisors is so general that we need not linger over the various reasons drawn from comparative anatomy upon which the theory is based. Our desire is to add a further proof from our own specimens.

If, as is now generally conceded, supplemental and supernumerary teeth are to be considered as reversions to the original type, then we have in one of our cases, in so

far as the upper jaw is concerned, an instance of the complete archaic human incisor dentition, Instances of this kind are, as Wedl observes, very rare. Galton quotes a case in which two perfectly formed supplemental lateral incisors were placed behind the normal lateral incisors in the upper jaw. Our case differs from this in the fact that in it the incisors are in perfect series. Mr. A. Wilson mentions three cases of this nature, one of which occurred in the temporary dentition. Professor Flower records a case observed in the skull of an adult Englishman in the museum of the Royal College of Surgeons of England, in which there were six incisors in the upper jaw, the supplemental pair being placed behind the normal incisors. Dr. Edwards figures a case in which there were five incisors, one of the median being geminous; this he regards as an instance of the co-existence of six incisors. We have described a somewhat similar case above, in which both the median incisors were geminous. An interesting case of a somewhat similar nature is described by Dr. Kirk. It occurred in the lower jaw in connection with the milk dentition. The right lateral was normal, the right median was twice its customary breadth and divided longitudinally into two halves by a deep groove, extending from the middle of the cutting edge of the crown to the lower end of what remained of the fang, giving the appearance of two teeth fused together. The root of this tooth was unfortunately so absorbed that its condition, whether single or double originally, could not be made out. The left median was normal, and its fang was about half absorbed. The left lateral was twice its ordinary breadth and longitudinally divided by a groove like the right median, and the root was unabsorbed and distinctly bifid for at least a third of its length.

The permanent teeth presented on their appearance no abnormality.

Cases in which five normally-formed incisors have been observed are fairly numerous, and seven such are included in our series. Supernumerary teeth are even more numer-

ous both in our own experience and in that of other observers. We have already described five cases in which there were two, and fifteen in which there was one. One case shows an unsuccessful attempt at reversion to the full dentition; here a small incisiform tooth is placed behind the right lateral and in series with it, and a blunt supernumerary tooth posterior to the left median. Mr. J. S. Amoores has afforded us information of an interesting case in which a supplemental tooth in the temporary series had a permanent successor. This case throws much light upon the question of the derivation of such teeth. Viewed from the light of atavism, these cases afford fresh confirmation of the theory

that man's incisor dentition was originally In $\frac{3-3}{3-3}$. It is

seldom that he attains to it in the upper jaw, still less frequently in the lower, never, so far as we are aware, in both simultaneously. But, on the other hand, in quite sufficiently numerous cases he regains one of his lost teeth, either well or ill-formed, or both in an imperfectly-formed condition; and, finally, this gain may occur in both dentitions.

II. *Man's lost incisor is the lateral or In3.*

We approach this portion of our subject with much greater diffidence, since the position which we maintain differs from that which has the weight of Professor Turner's name attached to it, and from the opinion which Baume has advanced. We shall first consider the view put forward both by Baume and by Edwards, as that which seems to us least tenable. The two chief reasons advanced by Baume are, firstly, that a diastema exists sometimes in apes and in man between the central incisors, and secondly, that supernumerary teeth are found either between the median incisors or immediately behind them. With respect to the first argument we are bound to say that our own experience in no way confirms Baume and Edwards' statements respecting the frequency of occurrence of a separation between the median incisors. For some considerable time we have

made observations upon this point, and are inclined to believe that any noteworthy separation at the point indicated is, at least in this district, uncommon. And it must be remarked that, as dental abnormalities are numerous amongst the class of patients attending at the Dental Hospital in this town, we should certainly have expected to find a fairly large number of instances of the separation, were it the marked feature which it has been claimed to be. In connection with the second argument, we think that any one who has examined such a series of models as are at our command will be struck at once by the fact, that whatever teeth are added or suppressed, the two medians typical in shape or invariably, or almost absolutely so, present.

Thus in the case of six incisors, if the question be doubtful whether In_2 or In_3 be the intruder, at least it is obvious that In_1 is the same in shape as the central in any normal series.

It is quite true that supernumerary teeth exist frequently in the middle line, but very rarely to the exclusion of the median. Moreover, we have specimens which prove beyond a doubt that the present lateral incisors may take up their position behind the median, which at least goes to prove that a tooth in this position need not necessarily be a suppressed median. We have specimens showing this occurrence in both upper and lower jaw, and affecting one or both laterals.

Finally, there are two other arguments based upon the dentition of Homalodontotherium and the undoubted suppression at present occurring of the lateral incisor, both of which will be dealt with at greater length in considering Professor Turner's theory, and both of which apply with even greater force to the refutation of that of Baume and Edwards.

Turner's theory is based upon facts learnt from a study of a number of cases of alveolar fissure. It is needless for us to repeat his remarks, which we have quoted at an earlier period. Their weight must be felt by all who have studied

the subject, and we can offer at present no explanation of the apparent contradiction which the facts he cites give to our theory. We would, however, venture to urge the following points in support of the view which we have taken that the lost incisor is In_3 .

1. The theory that man possessed six incisors is amongst other things based upon the dentition of Homalodontotherium. The dentition of this animal is, according to Tomes, "chiefly instructive in that the teeth in close juxtaposition one with another present an exceedingly perfect gradation of form from the front to the back of the mouth, no tooth differing markedly from its neighbor, though the difference between, say, the first incisor and first molar is exceedingly great. In Professor Flower's words, 'It is only by the analogy of other forms that they can be separated into the groups convenient for descriptive purposes, designated as incisors, canines, premolars, and molars.' In viewing the gradational characters which do exist between the various human teeth, it must not be forgotten that some links in the chain have dropped out and are absent. Mention has already been made of the full typical number of mammalian teeth being 44, that is:—

$$\begin{array}{ccccccc} 3-3 & & 1-1 & & 4-4 & & 3-3 \\ In- & C- & PM- & M- & & & \\ 3-3 & 1-1 & 4-4 & 3-3 & & & \end{array} = 44.$$

The human subject does not possess the third incisors nor the first two premolars, so that a somewhat abrupt change of form in passing from the incisors to canines, and from the latter to the bicuspid is no more than might be anticipated."

It will be seen from this quotation that Tomes puts forward the theory which we support upon the evidence of Homalodontotherium. If we suppose either In_1 or In_2 to be the missing tooth, the gradation theory falls to the ground unless indeed we assume that *pari passu* with the suppression of one or other of these teeth, the remaining become modified in form, so that the gradual alternation in shape

to the canine is lost, an assumption which is not supported by any facts of which we are aware.

2. It has long been held, and the facts which have been brought forward, together with those which we have yet to deal with, appear amply to warrant the belief that the lateral incisor In_2 is at present being gradually suppressed. This being so, it seems *prima facie* much more likely that the tooth which has already been lost is that which was next behind it in the original dental series.

3. In all those cases in which there are six or five incisor teeth in series, the additional tooth is, in our opinion, indisputably placed behind the lateral incisor, and is, in fact, as Dr. Albrecht and Professor Turner have styled it a "precanine." This feature is well shown in one of our specimens, where a small incisiform tooth is placed behind the true lateral and in series with it. Another again affords an admirable example of a similar state of affairs. On the right hand there are present In_1 corresponding to In_1 on the left, In_2 corresponding in like manner to its fellow of the opposite side, and behind it, and in a series with it, is an In_3 which forms a good instance of a tooth tending towards the shape of the canine, and bridging over the interval in shape normally observed between this tooth and that of the region in front. We believe that an examination of specimens of superfluous incisor teeth placed in proper series will go entirely to prove that the suppressed incisor is the third, and the argument thus supplied we consider far more conclusive than either of the others which we have advanced, valuable as they are, as corroborative evidence.

III. *This loss is consequent upon the contraction of the anterior part of the jaw.*

The fact that the jaws and alveolar arches of higher races are less well formed than those of lower is sufficiently recognized. On this point Oakley Coles writes as follows:—"It seems to have been proved fairly conclusively that irregularities and malformations of the upper jaw and palate are met with much more frequently amongst highly

civilized races than amongst those who have lived, or are still living under the semi-barbarous conditions. And it would further appear that the same irregularities are of more frequent occurrence amongst the working classes. The two hundred ancient skulls examined by Messrs. Cartwright and Coleman in the crypt of Hythe Church, presented without exception perfect maxillæ and extremely well-developed alveolar arches; while the more extensive researches of Mr. J. R. Mummery, extending to upwards of three thousand skulls of ancient and modern uncivilized races, lead to the conclusion that the perfect type of both dental and maxillary arches has been uniformly maintained amongst nations of simple habits and lives. Again, Dr. Nichols of New York, who has examined the mouths of thousands of Indians and Chinese, affirms that the jaws of both races are universally well formed and amply developed."

Darwin and Herbert Spencer have both noticed the decrease in size of the jaws in civilized races as compared with uncivilized, and in the upper classes of the former as compared with the lower. The latter states that the maxillæ of Australians, Negroes, and ancient British are absolutely larger than those of the modern English, and, when considered in connection with their smaller skeletons, the difference is of course very much more marked. We are inclined to believe, though we have not yet had an opportunity of working out the subject as fully as we could wish, for lack of material, that this decrease in size is exhibited in perhaps the most marked manner in the incisive region. Topinard states that the elliptical form of jaw is that which is most commonly met with among inferior races, the parabolic being that which more peculiarly belongs to the superior. From an examination of these two types of jaw the former certainly appears to afford a much more roomy incisive region.

A comparison between the various casts in our possession of English teeth and those casts and skulls of uncivilized

zed races which we have been able to examine, leads us to the conclusion that the incisive region in the latter is much less contracted than that of the former.

In a paper "On the so-called Serpent Teeth" Callender puts forward the theory that certain abnormalities of the incisive region may depend upon arrested or stunted growth of the incisive process of the superior maxilla. The same theory will help to account for the contraction of the incisive region leading to the suppression of teeth. If the incisive process be stunted in its growth then the proper development of the inter-maxillary bone is prevented and the incisors are thrown inwards or suppressed.

When it is considered that the incisor teeth are those used for cutting or dividing food, and when it is remembered how much their labors have been lessened amongst civilised races by the careful cooking of food, there will be no difficulty in assigning a reason for the gradual disappearance of these particular members of the dental series.

IV. *Suppression of the two present lateral incisors is now taking place.*

Cope has ventured to predict that in future the lower races of men will retain the dentition of the present day, whilst those intellectually higher will possess a diminished formula of

$$\begin{array}{cccc} \text{I—I} & \text{I—I} & \text{2—2} & \text{3—3} \\ \text{In—}, & \text{C—}, & \text{PM—}, & \text{M—} \\ \text{1—I} & \text{1—I} & \text{2—2} & \text{3—3} \end{array}$$

or

$$\begin{array}{cccc} \text{I—I} & \text{I—I} & \text{2—2} & \text{2—2} \\ \text{In—}, & \text{C—}, & \text{PM—}, & \text{M—} \\ \text{1—I} & \text{1—I} & \text{2—2} & \text{2—2} \end{array}$$

and the view which he puts forward as to the disappearance of the incisors is shared by other authorities on odontological subjects, whose opinions have been quoted in an earlier part of this communication.

We think that our Series, IV. to VIII. inclusive, afford good examples of this process of suppression in its various

stages. Series IV. contains cases in which there are at present three well-formed incisors and one of lesser development, a conical or supernumerary tooth. Series V. shows a still further advance in the substitution of a supernumerary tooth for one of the three still left of the normal shape in the former category. In Series VI. one tooth has actually disappeared. In Series VII., besides the suppression of one tooth, we have malformation or imperfection of a second, whilst in Series VIII. we finally reach the complete condition of suppression of both lateral incisors. We quote the ascertained ages as far as possible of the cases in this series, in order to show that these are not cases in which from immaturity the missing teeth might yet present themselves. In one case, three incisors, one being conical, existed in the superior maxilla, two only in the lower, those present and perfect being the central. This is interesting as being the closest approach to the reduced dentition predicted by Cope with which we are acquainted. It will be noticed that, of twenty-five cases included in this series, twenty-three are instances of suppression of greater or less degree of the lateral incisors, two only of the median.

Amongst these cases of suppression are three which form an interesting family group. The parents of these three children belong to the upper classes, were not related to one another, and present themselves no dental abnormalities. The eldest child, a girl aged 22, has neither lateral incisor in the upper jaw; the second, also a girl aged 20, wants the right lateral; whilst the third, a boy aged 17, wants, like the eldest, both the permanent laterals, but the deciduous right lateral is still present.

We think that, so far as the evidence from dental abnormalities goes, the case for the present suppression of the lateral incisors may be considered to be fairly complete.

V. *Conical Teeth a Reversion to the Primitive Type.*—That the simplest form of tooth is the conical is an obvious fact from Comparative Anatomy. It is interesting to observe, then, that in most of the cases in which an

attempt at a reversion to the full dentition is being made by nature, and others in which a portion of the present dentition is being suppressed, the abnormal tooth, being apparently unable to attain to its full development, remains of the same shape in which in lower animals is normal.

It is instructive to find that this reversion to the conical shape may be found in supernumerary teeth in other animals. We have a skull of a *Midas rosalia*, in which in the upper jaw there is a supernumerary tooth which we consider to be a premolar. This tooth has the same conical form as the supernumeraries in Man, and differs thus very markedly from the shape of its fellows of the same series.—*London Dental Record*.

Editorial, Etc.

AN INTERNATIONAL DENTAL CONGRESS.—A conference of dentists who were in attendance at the Eighteenth Anniversary of the First District Society of New York, was held in New York City, to consider the feasibility and advisability of taking steps for the calling of an International Dental Congress at some future date. Some thirty-five dentists were in attendance.

The meeting was called to order, and elected Dr. W. H. Dwinelle chairman, and Dr. George A. Mills secretary.

Dr. Kingsley opened the discussion by some remarks in which he considered the advisability of taking steps for organizing a meeting to be called an International Dental Congress, and he offered the following resolution :

Resolved. That in the opinion of the conference the interests of the dental profession throughout the world will be advanced by an International Dental Congress.

A discussion then followed, in which Drs. Northrop, Truman, Brophy, Hunt, Winder, Keech, Kingsley and the chairman took part. There was no difference of opinion as to the advisability of holding such a congress at some future time, and the years 1888, 1889 and 1891 were severally suggested and considered. The year 1890 was out of the question, because of another International Medical Congress to be held in that year. As to the time, no decision was reached. The resolution was carried unanimously. A second resolution was offered, viz.,

Resolved. That a committee of temporary organization be appointed, whose duty it shall be to make such a plan for a permanent organization as shall in their estimation best call out universal support.

This was also discussed and carried.

A third resolution was offered and carried, viz.,

Resolved. That this committee be empowered to fill vacancies and enlarge its numbers at their discretion.

This conference was amicable in a large sense, yet there was a free interchange of opinion. While all did not think alike in all things, wise measures were strongly advocated, so that it should not appear that there was any disposition to place obstructions in the way of any movement that sought the best good of all.

The meeting adjourned subject to the call of the chair.

ANNUAL COMMENCEMENT OF THE UNIVERSITY OF MARYLAND, DENTAL DEPARTMENT.—The commencement exercises for 1887 will be held at the Academy of Music, Baltimore, on the 16th day of March next, at 12 M.

The contest of the Graduating Class for the Annual Prizes, will take place in the Dental Infirmary on March 15th, commencing at 10 A. M.

This commencement will be held separately from that of the Medical Department. It has been the custom heretofore, to hold the commencement exercises of the two departments at the same time and place, but the large classes in both necessitates a change in this respect, and hereafter separate commencements will be held.

Bibliographical.

TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION.
—Twenty-sixth annual session, Niagara Falls, August, 1886.
The S. S. White Dental Mfg. Co., Publishers.

This volume, compiled by the Publishing Committee, contains 191 pages and consists of synoptical reports of the papers and discussions of the session.

CAULK'S DENTAL ANNUAL, NO. 5, 1886-87.—This is a valuable *Annual* for reference, as it contains much useful information in the form of statistics relating to the principle matters connected with the science of dentistry. Colleges, Societies, Dental Laws, Patents, Members of State Dental Boards, and other useful information receive notice. Dr. L. D. Caulk, Editor and Publisher, Camden, Delaware.

THE DENTAL OFFICE AND LABORATORY.—This quarterly journal begins its third series with the January number and has changed its form to that of a pamphlet of some twenty-five pages, which presents a very pleasing appearance. It is now edited by Theodore Chupein, who has long been a contributor to its pages. Publishers: Johnson & Lund, Philadelphia.

THE DENTAL REVIEW, of Chicago, is a new aspirant for professional favor, the first number having appeared in November, 1886. Its editors are Drs. Harlan, Wassel, Reid, Ottofy, and Davis, and it bids fair to be a valuable contribution to dental periodical literature.

JAMES VICK'S FLORAL GUIDE FOR 1887, is a beautiful volume which it would be extremely difficult to surpass, as it

is gotten up in the highest style of art, and contains much valuable information on every branch of the floral art. Flowers, shrubs and vegetables are treated of, as only those conversant with the most improved methods of their cultivation can describe such processes. The seeds, plants, &c., from this long established house, have, for quite a number of years, enjoyed the highest reputation as proving reliable and perfect.

THE WESTERN DENTAL JOURNAL.—This new aspirant for favor has made its appearance in a very creditable style, appearance. The first number contains some valuable articles and if the succeeding numbers are made up of like material, this new journal will merit the patronage of the dental profession. Publishers: R. I. Pearson & Co., Kansas City, Mo. We trust that this increase in dental periodical literature indicates an increased interest in the members of the profession to advance with the science.

Obituary.

DR. FRANK P. ABBOT.—The many friends of Dr. Abbot received a severe blow in the announcement of his death, which took place in Blasewitz, near Dresden, Germany. He had been a sufferer for many years from an asthmatic trouble, but he bore this, as he bore everything, with so much fortitude that any serious result was not anticipated.

It is very difficult at times to be reconciled to the inevitable,—to feel that the old, old story of death has again to be gone over with its long separations, and the deeper agonies of those nearest and truest; but in this case there is the consolation that his life has been a benediction and his example one worthy of emulation.

It is too true that often the individual must wait the closing of the grave before the finer incentives that have actuated

his life can be appreciated. This was not true of the subject of this sketch. He numbered his friends in many lands. In Germany, where he was best known, the time will be long before this life and its deeds will fade from the records of memory. This is the more remarkable when it is considered that Dr. Abbot never thrust himself prominently before the public or his profession. His contributions to dental literature were not extensive, nor did he actively enter into its discussions; but his interest in it was deep and lasting, and he was ever to be found at the front in active work.

He was born in Maine, and graduated at the Baltimore College of Dental Surgery in 1851, leaving shortly afterwards, the same year, for Berlin, thus becoming one of the pioneers of American dentistry in Europe. He drew into his professional life the teachings of Harris, and never in the long course of his extensive practice seemed to lose that influence. While active in interest in every new step that promised advancement, he was slow to adopt changes, preferring the old way. He seemed to the writer to be a remarkable combination of the liberal with a good share of conservative feeling in a professional sense. He was conscientious, and no one could help admiring his strong devotion to principle in refusing to be tempted to use materials which he might regard as objectionable. While he seemed thus to be opposed naturally to innovations, his courage was equal to any change that coincided with his judgment, though it might be in opposition to established rule. This was manifest in his faithful advocacy of tin and gold foils combined in one filling. He disclaimed any originality in this, but accepted it, and it was through his persistent efforts that this has come to be recognized as a valuable addition to practice.

His life, however, is truly his best monument. He was respected and loved by all classes. His advice was sought for by both Americans and Germans. His home was an open one, and his receptions were always enjoyable and crowded occasions. Speaking several languages fluently, he entertained largely many nationalities. The writer was most impressed, in his intimacy with Dr. Abbot, with his power over individuals. There was nothing of the sycophant about him. He

was true always to his American instinct, and yet few men can say to the same extent as he could that they were held not only in high estimation, but even enjoyed the affectionate regard of some of the highest in his adopted country. It was always a pleasure to the writer to hear the upper classes of Hanover—the nobility of the old *regime*—speak of Dr. Abbot. He had but to say to them professionally go, and they went. His recommendation was law to them, and by a proper use of this power he was always able to help, provided he was convinced of the worthiness of the subject. His advice was constantly in demand by young practitioners and rarely refused.

A remarkable trait was his ability to accommodate himself to circumstances. It was the privilege of the writer on one occasion to receive from him a lesson in contentment not very soon forgotten. He had suffered great losses financially in stocks after the French and German war of 1870. We were riding together through the environs of Paris. The conversation naturally turned on the beauty of the surroundings and the wealth required to produce these results. The writer ventured to express the deep regret that he felt for Dr. Abbot's serious losses, and that the labor of his lifetime had been so rudely scattered. Responding with a good deal of energy he said, "Don't sympathize with me; you should rather congratulate me, for it was the best thing that could have happened. I can now sleep well at night; have no trouble about stocks, and besides have received a good lesson."

While ever polite in his intercourse with his patients, he seemed to care very little for mere nobility. It is said of him that on one occasion he was called to the Royal palace at the command of the Empress. He waited long, and no Empress appearing, he collected his instruments and departed. This may seem a slight thing to the average American, but it was a very bold thing to do in the presence of royalty. Prince Albrecht, nephew of Emperor William, was always an attached patient of his. This prince held court in Hanover in the palace of the old King George. While operating for the prince on one occasion he asked him, as he laughingly informed the writer, "Why don't you come to me in the car or omnibus, instead of driving here in your carriage?" "That," replied

the Prince, "would be a convenient way, but then, you know, I would not be respected."

Dr. Abbot leaves a son to succeed him, who has recently graduated from the dental department of Harvard University. His son-in-law, Prof. Miller, has also been long connected with him, so that the practice he so faithfully labored to perfect is left in competent hands. He married the daughter of Hon. Theodore S. Fay, formerly Minister to Switzerland. His wife and two children survive him. Mr. Fay belonged to that brilliant circle of cultivated men of the past generation who were recognized as a power in the then political world. He resides with his family near Dresden. The daughter of such a man was well fitted to second Dr. Abbot in his social relations, and by her culture and conversational powers added greatly to the comfort of the many who frequented his hospitable home.

Upon the grave of this genial life—this open-hearted friend—the wreath of immortelles may justly be placed. In the presence of the mysteries of creation we are as children; in the presence of death we question the possibilities of an untried path. We linger on the memory of the good and true, and in this, the holiest of temples, we enshrine our friend.—JAMES TRUMAN, in *Dental Cosmos*.

Monthly Summary.

RESTORING A BICUSPID.—By A. H. Hilzlm.—A left upper bicuspid, the buccal cusp was entirely gone, even up to the margin of the gum. Some one had endeavored to fill this tooth, and partially restored the contour with amalgam, which did not answer the description of the various "white alloys" now advertised, as it was quite *black* and unsightly. As it was "leaking" all around its edges, and very sensitive to "sweet things," I removed the filling.

The work of removal was done very carefully, as there was danger of breaking the remaining cusp, and this would

have spoiled the operation I had in view. The great black lump of amalgam removed, I found, fortunately, the nerve not exposed.

You will say why not contour the tooth with gold? But the patient objected to so much gold showing, almost as much as the amalgam, besides I suggested a better plan. I first undercut the remaining cusp as much as possible, and prepared the tooth throughout, as if for filling. I took a piece of pattern metal about one-sixteenth of an inch wide, and long enough to encircle the tooth; fitted it around nicely, removed it, and patterned from it a strip of gold, from a piece kept for such purposes, and having bent it to conform, as nearly as possible to the shape of the tooth, soldered it smoothly together.

After beveling the edges, and polishing this band nicely, it is placed in position over the broken tooth, and with the automatic mallet driven home. When in position, the upper edge of the band is slightly under the margin of the gum, and the lower extends down over the broken surface of the tooth, and forms a socket or receptacle for—well anything you may choose to insert.

However, my plan at this juncture was to take a short cuspid (rubber tooth) and grind the neck of it; so as to fit nicely down within the band, and at the same time to articulate with the lower teeth, and to fall into line with, and conform in appearance to, the upper teeth.

Oxyphosphate is then mixed to a proper consistency, placed within the band, and the cuspid forced into this and held in position, till the phosphate sets firmly around it. Now, with gold, or a good article of amalgam, fill in round the pins of the artificial cusp, and in the undercut of the natural one, and you have something for your pains, which your patient and you will be well pleased with.—*Miss. Trans.*

REMEDY FOR TIRED EYES.—People speak about their eyes being tired, meaning that the retina, or seeing portion of the eye, is fatigued, but such is not the case, as the retina hardly ever gets tired. The fatigue is in the inner and outer muscles attached to the eye-ball and the muscle of accomoda-

tion, which surrounds the lens of the eye. When a near object is to be looked at this muscle relaxes, and allows the lens to thicken, increasing its refractive power. The inner and outer muscles are used in covering the eye on the object to be looked at, the inner one being especially used when a near object is looked at. It is in these muscles mentioned that the fatigue is felt, and relief is secured temporarily by closing the eyes or gazing at far distant objects. The usual indications of strain is a redness of the rim of the eyelid, betokening a congested state of the inner surface, accompanied with some pain. Sometimes this weariness indicates the need of glasses rightly adapted to the person, and in other cases the true remedy is to massage the eye and its surroundings as far as may be with the hand wet in cold water.—*Herald of Health*.

LOCAL REMEDY FOR NEURALGIA.—A mixture of one part of iodoform to ten or fifteen of collodion, if spread repeatedly upon a neuralgic surface until it attains a thickness of one or two millimetres, is said to be quite effective in the treatment of certain neuralgias. If the first application does not speedily terminate the neuralgia, those who have used this mode of treatment direct that its application should be continued. It seems especially valuable in the relief of neuralgias of the trigeminus. It also seems of value to be applied along the spine, particularly at painful points in what is called spinal irritation. These observations are by no means new, and yet they seem worthy of further consideration.—*Neurological Review*.

A DISINFECTANT.—A new disinfecting compound for purifying the atmosphere of the sick room has just been presented to the Berlin Medical Society. Oils of rosemary, lavender and thyme, in the proportion of 10, 2½, and 2½ parts respectively, are mixed with nitric acid in the proportion of 30 to 1½. The bottle should be shaken before using, and a sponge saturated with the compound and left to diffuse by evaporation. Simple as it is, the vapor of this compound is said to possess extraordinary properties in controlling the odors and effluvia of offensive and infectious disorders.—*Pacific Record of Med. and Phar.*

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ARTICLE I.

ODONTO-CHIRURGICAL SOCIETY.

At the meeting held on December 9th, a discussion arose upon the disease known as

PYORRHŒA ALVEOLARIS.

The President said the disease, for some time termed Riggs' disease, and now better named Pyorrhœa Alveolaris, has long been known, but has only been much debated during the last twenty years by Riggs, Mills, Albrecht, Wedl, Salter, Tomes, Arkovy, Miller, Rehwinkel, and others more or less known in the scientific walks of dentistry. I do not propose to enter an opinion as to its pathology or etiology, nor yet to discuss the various methods of treatment or remedies advocated by these gentlemen, but will confine myself to a simple statement regarding the use of sulphur as a curative agent in this lesion. Whatever may be our opinion as to the part which tartar plays in this disease, I think we are all agreed that tartar being matter in the wrong place, it should, if present, be thoroughly removed, so as to give any subsequent treatment the best possible field for its recuperative action. This being done, I find that the bi-daily cleansing of the teeth and gums with

a tooth-powder composed of flowers of sulphur and precipitated chalk, will very soon restore the parts to a healthy condition, the pus secretion will cease, and the teeth become firm in their sockets. Whether the tartar be the cause, or only a concomitant, or the pyorrhœa be owing to a perverted condition of the mucal secretions, sulphur will, and does, act beneficially.

Its therapeutic action is stimulating and antiseptic, and it is likewise a solvent of calculus. If it contains a little free sulphurous acid, which it frequently does, so much the better.

As I have said, it is stimulating, antiseptic, and a solvent of calculus, and it has this further, and what, I think, very great merit, viz., that it can be regularly and thoroughly applied by the patient. I have now been using it for over a twelvemonth, and have reason to be satisfied with its uniform success; and as I recommended it to the members of this Society in March last, I will be pleased to hear how it has succeeded with those who have given it a trial.

Dr. Smith said he had not been present at the last meeting, and his being called upon to make any remarks upon this interesting and somewhat important affection to-night was unexpected. In the first place, he would say that he believed the mixed power of sulphur and magnesia, brought before the Society by Mr. Macleod, was, in all probability, destined to be of much service, not only in pyorrhœa alveolaris, but in other affections of the mouth. The *rationale* of its action seemed founded upon tangible principles, as there was no doubt that sulphur and its combinations had played a prominent part in the *role* of therapeutics as applied to similar affections. With reference to the pathological nature of pyorrhœa alveolaris, or Riggs' disease, two theories might be advanced—first, that it commenced from without; and second, that it commenced from within. Among those cases commencing from without might be classed such as originated in the alleged irritation caused by the deposit of tartar, or in inflammation of the

gum and mucous membrane ; and among those originating from within, the occurrence of alveolar caries would, in all probability, be found a common cause. Tartar and inflammation of the gum did not always give rise to the symptoms distinctive of pyorrhœa alveolaris, but caries of the alveolar walls invariably did so. The anatomy of the parts in a great measure accounted for this. It was admitted in surgery, that, as a general rule, pus seeks the nearest and easiest mode of outlet, and if this were an affection of the gum and submucous tissue, it would manifest itself to a proportionately greater extent beyond the margin of the alveolar cavity than it very frequently does. But, in a large number of cases, the symptoms during its continuance, and the appearance and lesions of the alveolar walls after its existence, showed that these had been the structures principally concerned in the disease. This accorded with Dr. Smith's own observations in this affection, to which he had for long paid considerable attention ; and also with the morbid appearances described by most writers on this disease. Dr. Smith had said that, *prima facie*, the disease commenced with, and consisted in, caries of the alveolar plate ; and that the tartar deposit and inflammatory appearance of the gum, were possibly of a secondary nature. It might be argued that the alveolar plate was not altogether the kind of bone in which caries occurred ; that necrosis and rapid separation of the dead part would be more likely to take place there than a long protracted ulcerative process. But this reasoning was here to be met in the local modifications of the bony tissue. Necrosis was, no doubt, the common affection met with in compact bone, and caries in the cancellous variety. This did not arise from the disease in its ultimate pathology being different in the two cases. In necrosis, the result of the inflammatory action and exudation was death of a piece of the bone by obliteration of the vessels contained in the Haversian canals, owing to the unyielding nature of the mass of compact bone surrounding them. In cancellous bone, room was afforded

for dilatation of the vessels, so that complete stasis was not occasioned by the exudation. And in the very attenuated alveolar walls, the pressure outside the vessels would be comparatively diminished also, and might explain the more frequent existence of caries there.

The question whether this caries, or rather what is called rarifying osteitis, is a primary or secondary lesion, was difficult positively to decide. Cornil and Ranvier assert that it is secondary to fatty degeneration of the contents of the lacunæ, and subsequent inflammation and destruction of the trabeculæ in their vicinity, which then form so many centres of suppurative inflammation. While this is the opinion of one set of pathologists, others believed that inflammation precedes this fatty degeneration and may be of a simple scrofulous, tubercular, or syphilitic origin. At all events, the symptoms described by authors who have written on this disease would indicate, in the separation of the dento-alveolar structures, the channelling of the sockets and disappearance of their bony walls, that one form at least was probably due to alveolar caries.

It seemed very uncertain whether the deposition of tartar was not, in many cases, a result rather than a cause of the disease; the dark coloured and hard tartar was always found in much less quantities than the softer and white variety, and probably had been slowly deposited and stained in some manner due to this longer exposure of its surface. This dark tartar, too, was much more frequently found at the necks of the upper teeth than was the white variety. It was also found on the denuded fangs of teeth, which denudation, again, had probably been brought about by a form of alveolar caries, possibly without suppuration, as this was known to occur in other parts of the skeleton, and sometimes appeared more like ordinary absorption of the bone than any other form of disease.

Mr. Wilson said he quite agreed with what Dr. Smith had just said. The initiative was always periostitis, followed by disintegration of the alveoli, so that it might be the result of either local or constitutional causes.

He had lately advised the use of the powder recommended to their notice by Mr. Macleod, but could not yet say with what success.

Mr. Macgregor said he had used Mr. Macleod's prescription in one or two cases, and had found most marked and beneficial results following its use.

Mr. Durward spoke favourably of the sulphur powder, and said he had also found it a good powder for use where artificial teeth were worn above stumps.

Mr. C. W. Watson thought that if this mixture advocated by Mr. Macleod, used as a tooth powder, gave satisfactory results in the treatment of pyorrhœa alveolaris, it would be a great boon to us, as our patients would be able to take in hand their own treatment. In this disease, there is a pocketing of the gum round the teeth, softening and destruction of bone at alveolar margins, and an oozing out of a serous or sero-purulent secretion, which is laden with micro-organisms—bacteria, micrococci and bacilli (allied to algæ). This secretion seems to be derived from the connective tissue of the parts, and is thought to induce the same condition in adjacent healthy teeth by infection. He had tried to produce the disease in the dog by scraping its gum and spreading some of the secretion over it, but failed to get any result, though this might not be the case were a human subject inoculated.

The first step in the treatment of this disease is to scrape the softened bone and remove all the tartar, which, however, is not always present. In reference to this tartar, there is a variety found pretty far up on the root, of a dark greenish colour—especially in cases where there has been considerable destruction of the bone at the alveolar margin. This was, he thought, derived from the exudate and not from the saliva.

The same condition was observed, as a result of chronic alveolar abscess, where no sinus was present, and he had repeatedly found, on extracting such teeth, nodules of this dark tartar at or near the apex of the root, where no saliva could possibly reach.

The presence of micro-organisms in the secretion of the gum pockets must tend to keep up a great amount of irritation, if they are not the direct carriers of infection themselves, and it is, therefore, important to get rid of them as soon as possible.

They are divided into two groups—ærobian, those requiring oxygen for their development; and anærobian, those that do not require oxygen for their development. A mixture of hydrogen peroxide and hydrargyri perchloridi, injected repeatedly into the gum pockets, destroys both varieties, and this should be followed up with aromatic sulphuric acid, to cause granulation of diseased parts. This treatment, carried out every three or four days for several weeks, generally results in a speedy cure. It was to be hoped, however, this new cure would render this somewhat elaborate process unnecessary.

Mr. Amoores, in reference to Mr. Watson's recent remark, that the presence of tartar is not invariable in this disease, said he remembered Mr. C. S. Tomes citing a case in point during a discussion which bore largely upon this subject, at the International Medical Congress of 1881. It was the case of a patient aged 25, in which he extracted all the remaining teeth, and on many, which were distinctly affected, there was no trace of tartar. He had also heard the suggestion respecting the serous origin of the hard greenish variety once or twice before, and he thought he was right in referring it on one occasion to Mr. Coleman in one of his lectures. He (Mr. Amoores) had found it very high up on the roots of teeth, very commonly upon badly inflamed stumps, apparently beyond the reach of the saliva, though he could not recall having found any directly enclosed in an abscess sac.

The Third Ordinary Meeting of the Society was held on January 13th, the President, Mr. Bowman Macleod, in the chair.

The paper for the evening's consideration was entitled:

A FEW NOTES ON ALVEOLAR HÆMORRHAGE.

BY JAMES M. NICOL, L. D. S., EDIN.

The object of the present paper is rather to act as the starting-point of a good and thorough discussion upon the subject of Alveolar Hæmorrhage, and to elicit the opinions of those members who, from long experience, have a right to offer them, than to contribute anything either new or startling. That it is an important question for the dental surgeon to know how to treat an obstinate case of hæmorrhage following upon tooth extraction, or any kindred operation in the mouth, all will admit; and such a Society as ours affords peculiar facilities for obtaining some definite and clear principles upon which to act in such a case.

The subject naturally divides itself into three parts, viz:—Varieties, Causes, and Treatment.

I.—VARIETIES.

Our works on surgery divide hæmorrhage into three kinds—arterial, venous, and capillary, and in addition to this well-marked classification, various attempts have been made to classify according to the causes, and such terms as traumatic, spontaneous, active, passive, critical, periodical, have been used. These, however interesting they may be, so far as other hæmorrhages are concerned, do not enter into our calculations so far as the alveolar varieties may require our treatment.

For all practical purposes, alveolar hæmorrhages may be said to be included under the heads of Traumatic, Vicarious, and Constitutional.

(a) *Traumatic*.—In a sense, all alveolar hæmorrhages are traumatic, but it will, perhaps, be better to confine this term to the ordinary primary hæmorrhage following the extraction of one or more teeth. It is, as a rule, easy of control, and generally ceases of itself in a very short time. At the same time it may, from various causes, last so long that it becomes necessary to take means to stop it. If there be much inflammation of the surrounding tissues, primary

hæmorrhage is likely to be very profuse and of some duration, owing to the vessels not contracting so readily as when in a healthy condition; or the profuse primary hæmorrhage may occur as the result of accident, such as a portion of the tuberosity of the upper jaw coming away in extraction of the wisdom tooth; or a lower wisdom tooth may have its roots embracing the inferior dental artery, and may cause its rupture in extraction. These are, however, rare occurrences, and speaking generally, the ordinary hæmorrhage following tooth extraction is not profuse or long-continued.

(b) *Vicarious Hæmorrhage*.—Probably the most frequent explanation of exceptionally profuse hæmorrhage is that it is vicarious of some other blood flow. The most common illustration of this is that of a woman having a tooth extracted at the menstrual period, when very frequently an alarming hæmorrhage will take place, and the menstrual flow be correspondingly diminished or absent altogether. Alveolar hæmorrhage may also be vicarious of epitaxis in full-blooded people who are subject to periodic attacks of bleeding at the nose. A little judicious inquiry will generally enable the operator to make up his mind upon a case of profuse primary hæmorrhage.

(c) *Constitutional*.—The hæmorrhages to which this term may be applied undoubtedly provide some of the gravest cases with which we have to deal. Fortunately they are so rare that many dentists pass through a long professional career without meeting with one. Certain constitutional conditions seem to predispose to hæmorrhage; an anæmatic condition, for instance, this being probably due to weakness of the contractile power in the vessels. Anything which tends to lower the system, as bad diet, or any chronic disease, is apt to produce a state of constitution favourable to hæmorrhage. In addition to all these, we have that special condition to which the name Hæmorrhagic Diathesis is applied, which is practically a confession of our complete ignorance as to its causes and treatment. What

we do know about this state is; that it is often hereditary, that it is more frequent in males than females, but seems to be more often transmitted through the mother than the father, and that it is a congenital condition, usually manifesting itself first in early infancy; but as to its pathology the authorities differ completely. The symptoms include a marked tendency to hæmorrhage from very slight causes, or apparently from none at all, and in many cases swelling of the joints, especially the knee joint. That which makes a patient suffering from this condition such a serious responsibility is the fact that the primary hæmorrhage is often not at all profuse and shortly ceases. Then some time after, secondary hæmorrhage will commence, which may either be profuse from the socket of the alveolus, or may consist of a capillary oozing from the edges of the gum round the wound, this latter form being the most troublesome to stop. The case is often further complicated by the fact, that either through ignorance or carelessness, the dentist is not informed of the state of matters before the operation, or even immediately after it; and he may have extracted not one, but several teeth, thus increasing the gravity of the case a hundred-fold.

II.—CAUSES OF HÆMORRHAGE.

These have practically been dealt with under the previous head; and need not be further discussed here, except that I would like to draw attention to a possible cause which I have not seen noticed hitherto, and that is alcoholic excess. My attention was drawn to this as a possible cause during the early part of last year. I had occasion to see a patient, a man of good position, who had ruined his constitution with drink; had passed through one attack of delirium tremens, and was then under treatment for the prostration following upon that attack. The first lower molar on the left side was very loose, and causing him a good deal of irritation, so it was extracted, and as the bleeding did not seem anything more than usual, no extra precaution was taken. The hæmorrhage, however, did not cease, but con-

tinued in the form of a slow dribble all that day and night; the patient then became alarmed, and it was necessary to pay three visits in one day and plug the alveolus firmly with lint soaked in Dr. Richardson's styptic colloid, each time, before the bleeding was finally checked: After a day's intermission it broke out again, but less profusely, and after plugging again in the same manner it finally ceased. One thing struck me very much in connection with this case, and that was the appearance of the gums, tongue, and surrounding tissues—they looked and felt perfectly disorganized and rotten, and I could quite believe that a scratch of the gums or tongue might easily set up another attack of bleeding. This coincides with the well-known fact that habitual drinkers make very bad subjects for accidents or surgical operations, their wounds as a rule not healing well. Of course it is impossible to build up any theory upon one case only, but I mention it in case anyone else may have noticed a similar one.

III.—TREATMENT.

Passing now to the all-important question of treatment upon which the welfare, and perhaps the life, of a patient may depend. In the case of simple profuse primary hæmorrhage, the treatment does not generally need to be of a very vigorous order. The application of a plug of lint saturated with Dr. Richardson's styptic colloid I have generally found sufficient, accompanied by rest in the recumbent position, with the head slightly raised. Where the hæmorrhage is vicarious it will generally be very profuse, but not of long duration; and the same simple measures will, as a rule, suffice to put an end to it. With regard to the more serious secondary hæmorrhage, the socket should be first syringed well out with warm water, then small strips of lint soaked in some styptic packed firmly down into it with a small ball-headed plugger; the lint is better used in small pieces, as you are thereby enabled to take the plug out piece-meal after the bleeding has been checked; whereas if you use one large strip of lint, the operation of loosening

such a large plug is very liable to start hæmorrhage again. This plug of lint should be built up so as to project above the gum and then some form of compress must be used to press it firmly and evenly. A very simple and very efficacious one can be made by taking a piece of gutta-percha tube, about three-quarters of an inch in diameter, such as is used for call pipes, have the piece long enough to extend over one or two teeth in front and behind, slit it up one side and bend the edges apart, when it will be found to form a clumsy clamp, with a fair amount of spring in it; by means of a hot knife it can be pared to suit the shape of the jaw, and also gutta-percha can be built up on the top of it so as to meet any teeth in the opposite jaw. Let this clamp be lined with lint soaked in styptic colloid, and the edges of the gum round the plug carefully painted with a thick coating of the same styptic, then the clamp placed in position, and the patient directed to close the mouth until the teeth are about half-an-inch apart; this will allow of swallowing with a certain amount of ease, and will check any sucking of the parts, which is always to be prevented, as it only places matters where they were. As soon as the gutta-percha into which the opposing teeth bite has cooled sufficiently, the jaws should be carefully bound up and kept so for some days. Messrs. Ash & Sons' "Chin Appliance" for retracting the lower jaw will be found very useful for this purpose, and is rather more sightly than an ordinary bandage. When all hæmorrhage has ceased for some days, the compress may be removed, but it is generally wiser to leave the plug for a few days afterwards, as it generally loosens slightly in that time, and can be taken out with less risk of starting the hæmorrhage once more. Should there be very few teeth left in the mouth, or none at all, I should think the best plan would be to take models, and strike upper and lower plates, to which very strong spiral springs might be attached, and the plates lined in the manner indicated above. If the patient is only kind enough to let the dentist know beforehand the danger he is running, I believe

that in the great majority of cases secondary hæmorrhage can be prevented altogether by plugging the socket immediately after the operation with strips of lint soaked in the styptic colloid. It seems as if very little would check the secondary hæmorrhage at the moment of commencing, but once it gets fairly started it is much more difficult to stop. I have found several patients who announced themselves as "bleeders" give very little trouble when treated in this way. I should certainly under no circumstances extract more than one tooth at a time for a "bleeder." The multiplication of wounds only increases the difficulty of stopping the hæmorrhage. With regard to styptics; as you will have gathered, I pin my faith to Dr. Richardson's styptic colloid. It has many advantages over perchloride of iron; the latter making a nasty mess of the mouth, and even causing inflammation. Properly applied, in combination with firm pressure, I have never known the styptic colloid to fail. With regard to other local measures, the actual cautery has been tried in several cases, but with scant and only temporary success; and there is always the risk of wounding the cheek or lip in applying it. Matico leaf, tannic acid, gallic acid, and turpentine have also been tried, sometimes with success, sometimes not. In one or two cases on record, everything that could be suggested has been tried without success, and the termination has been the death of the patient. Of such a case, my old master, the late Dr. Roberts, of Edinburgh, gave an account in his paper read before this Society some years ago, and the results of that case are to be seen in the Society's museum, in the shape of an ingenious compress which he invented for checking alveolar hæmorrhage. I well remember that the gist of his teaching to his pupils in this subject was styptics and pressure, and I am bound to say I have found his teaching correct. I have said nothing on the subject of constitutional treatment, as I consider that belongs to the medical man's department, and such a serious thing as a bad case of secondary hæmorrhage always ended in con-

junction with the physician or surgeon. But I cannot leave the subject without referring briefly to the important point opened up by the case communicated to the Odontological Society by Mr. J. S. Turner, at one of the recent meetings, in which the patient had been prepared for the extraction by being put on a course of tincture of ergot and sulphuric acid for a week previous to the operation. It was an undoubted case of hæmorrhagic diathesis, as the patient had upon several previous occasions bled almost to death as the result of tooth extraction; on this occasion, however, although secondary hæmorrhage set in about twenty-four hours after the operation, it was of a very slight and unimportant character, and soon passed off. In this case Mr. Turner had the advantage of knowing beforehand the condition of his patient, and under similar circumstances I should certainly see the patient's medical attendant, and consult with him as to the advisability of some similar course of preventive treatment; but as it often happens that the dentist knows nothing about the danger until the operation is over, it is imperative that he should have all his apparatus ready, and at hand, for stopping all hæmorrhage.

It will be found an excellent plan to fit up a small box or bag with all the most useful requisites for arresting hæmorrhage, so that if called out at night, as has happened to the writer, you have nothing to do but lift your bag or box, and go.

One case of hæmorrhage, if it be a serious one, will be quite as much as any dental surgeon will ever wish to encounter; and after meeting with it, he will be much more likely to over-estimate the risks of prolonged bleeding than to under-estimate them.

In conclusion, I can only enforce, as the result of what little experience I have had, the great desirability of plugging the cavity at once after the extraction, before the patient has left the house, if there is any suspicion of liability to hæmorrhage. As I have pointed out, this will often prevent secondary hæmorrhage altogether, and it is the

secondary hæmorrhage which is to be so much dreaded; besides, it also prevents the injudicious attempts which the patient and friends make to stop the bleeding before calling in help; which often consist of putting the patient in front of a roaring fire, wrapped up in blankets, and administering hot drinks and mouth washes; thus aggravating the very state of things which they want to stop; and, of course, the longer a case of hæmorrhage is allowed to go on before it is treated, the less likely is treatment to be successful.

In the discussion which ensued—

Mr. Wilson said, that in all ordinary cases (that is, where the blood was forming a clot) he found the mere plugging the alveolus with cotton wool soaked in Richardson's styptic, and then placing over the plug and alveolar margins a saddle of cork, thick enough to bring direct pressure to bear on both by the closure of the jaws, quite sufficient. The saddle was made to fit in as tightly as possible between the teeth on each side, so that none of the pressure was lost, which would be the case if the saddle, whetlier made of cork, gutta-percha, or other material, was so broad as to include these teeth.

He was thankful to say that of these cases, in which there was a want of coagulability, he had only met with one, the bleeding being set up by the patient (a boy) picking out a small morsel of a temporary root. Suspecting the patient of aggravating it by sucking, he covered a considerable surface with a gutta-percha-lined plate, and the case yielded to constitutional treatment. He decidedly objected to the use of perchloride of iron, or burnt alum, as styptics in the mouth.

Mr. Macgregor mentioned one or two cases which had occurred in his practice. About fourteen years ago, the late Dr. Angus Macdonald called him up about one o'clock one morning, to see a patient of his who was suffering from a severe attack of hæmorrhage from the sockets of a lower molar and bicuspid tooth, which had been extracted on the preceding day. The doctor had, for four hours, been un-

successfully endeavouring to arrest the flow of blood, using perchloride of iron as a styptic. Mr. Macgregor removed the clots of blood, and syringed the part thoroughly, and applied Richardson's styptic colloid. The first application was unsuccessful, but after applying it a second time, and using considerable force in packing the cotton steeped in the styptic down into the sockets, the hæmorrhage ceased. He waited for about an hour to assure himself that no recurrence was likely, and then left. The case was rather a serious one, as the patient was very weak and anæmic from the loss of blood, which had been considerable, and had it proved obstinate and recurred, a serious result was apprehended.

On another occasion, when putting in an artificial denture, he noticed that a loose root interfered with the adjustment of one of the clasps, and to remedy the matter, removed it with the point of an excavator. Two days afterwards, the patient returned with the blood flowing from this shallow socket. In the interim, she had been to a druggist, who had attempted to arrest it with perchloride of iron, until the mouth was perfectly blackened with it. The bleeding was stopped in a short time by a steady application of the styptic colloid.

In one instance, which occurred to him, the hæmorrhage recurred in the mouth of a patient after it had been arrested for one or two days. He had, when occasion required, used the saddle-shaped piece of cork to keep the plug in position, as referred to by Mr. Wilson, and found it very efficacious.

Mr. Finlayson mentioned several cases which had occurred in his practice, similar to those spoken of in Mr. Nicol's paper, particulars of which he gave to the meeting.

In treating hæmorrhage proceeding from extraction of teeth, he made sure that all clots were cleared out, these being, in his opinion, the main cause of the bleeding, as they were generally of a soft fibrinous character, containing fluid blood in their substance, and of a spongy nature, thus

serving to keep the wound open. This having been accomplished, the edges of the gums were steadily and firmly pressed together with a slipping motion of the finger and thumb, and a previously prepared saddle of dry lint bound with floss silk, to prevent change of form or absorption, carefully adjusted to bring pressure to bear on the sides of the gums—more than on the top—the depth of saddle being so arranged that it came first in contact with the opposing teeth or gum. He had never plugged the socket.

In all cases, a chin bandage ought to be applied to prevent the lower jaw pressure from being removed for, at least, five or six hours—milk diet, quiet, a sitting posture, and coolness of surroundings being insisted on. Many cases of bleeding owed their origin to the administration of stimulants before or after the operation, and he had, for some years, adopted the rule of cautioning patients, either in hospital or private practice, to avoid the latter when unusual bleeding occurred in the surgery.

Mr. Finlayson mentioned the case of a boy, eight years of age, who had taken out one of his own teeth; the resultant hæmorrhage being so profuse and continuous as to defy all treatment. Those in attendance were expecting death; the pulse being almost imperceptible, and the countenance pale to a degree. In this case the bleeding stopped short of causing a fatal result, and the boy made a rapid recovery, being seen a few weeks afterwards running about apparently well, but with that delicate complexion peculiar to those of hæmorrhagic habit. The mother was a "bleeder" also.

Leech bites had sometimes proved troublesome, but, as a rule, the cleansing away of all soft stringy clots, and the application of moistened matico, or the lunar caustic point, with immediate and continued pressure, dry lint pads being used, had always proved sufficient to stay further bleeding.

A very good internal remedy, in cases of this sort, he had found to be an acidulated solution of sulphate of mag-

nesia, which, given every hour, acted as a depressant and astringent.

Mr. Munro made a few remarks to the effect, that if in a case of alveolar hæmorrhage the blood was seen to issue in small jets from the socket, or there was reason to suspect the partial rupture of a small artery, it would be advisable, before applying the plug and pressure, to pass a small sharp instrument down into the socket and completely divide it, and thus give natural hæmostatics a fair chance by allowing the inner coats of the artery to retract within the sheath, and afford a better opportunity for the blood to coagulate.

Mr. Mackintosh had found the sryptic colloid most valuable, and had also, in one or two instances, had occasion to tie up the jaw in the manner indicated by the previous speakers. He had also found water, as hot as it could be borne in the mouth, very effectual in arresting primary hæmorrhage.

The President said that the paper with which Mr. Nicol has favoured us is a good and interesting one is evinced by the hearty way in which its subject and premises have been discussed. Few practitioners of any length of practice but have had, at one time or other, considerable concern regarding the ultimate issue of some case of persistent or of secondary hæmorrhage. I fancy, however, if I may judge from my own experience, that there is seldom any cause for grave apprehension, the cases being few and far between which do not yield to careful and rational treatment. I would take exception to the general statement of Mr. Nicol, that where you have a predisposition to bleeding not more than one tooth should be extracted at a sitting. I find in practice, that the greater the number of teeth removed, the less proportionately is the hæmorrhage which follows, and in answer to the query, Why? I would illustrate it by analogy. Consider, for one moment, the teeth to represent so many tenements in a street, and that each house is supplied with water by branch pipes from the main. The total calibre of these branches is greater than the calibre of the

main. Open one branch, the pressure is great; open two, and the pressure is reduced; open them all, and the pressure is reduced to the minimum. So with the blood-vessels, by opening more branches you reduce pressure and give every chance to the tonic and contractile powers of the vessels to close up upon the clot forming with the sheath, and making a firm and non-porous plug. The large clots, seen in bleeding cases, result from a too rapid coagulation, and are consequently porous and spongy. Hot water, as a styptic, is a very useful application, the heat of the water should be about 120° F., hotter will scald and destroy the tonicity of the vessels, as well as impair the integrity of the clot, while the action of water at, or about, 120° is that it expands the vessels, encourages coagulation, and the vessels being expanded during coagulation, upon cooling down to the normal temperature contracts and compresses the clot and renders it more dense. Cold water, on the other hand, being a capital solvent of blood, encourages bleeding; when cold is applied to a bleeding vessel or surface, it must be applied in a dry form. I use a very similar compress to that described by Mr. Wilson, using "Godiva" or "Stent" instead of cork. Within the modelled compress I place cotton wool, and super-saturate it with collodion, placing it in position, fixing the under jaw with a two-tailed bandage. This I sometimes precede with a lead and opium pill. I never plug the socket—firstly, because I obtain better results without it; and secondly, because the removal of the plug is apt to induce a recurrence of the hæmorrhage. As for Richardson's styptic, while admitting that it is an excellent styptic, I think better results are obtained by the use of *pure collodion*, the presence of the tannin either being inoperative, or if operative, it must be dissolved from out the collodion sheath, and render it less strong and valuable as an impervious covering.

I am glad that Mr. Munro has called attention to one cause of bleeding, perhaps more frequently attending tooth extraction than we are apt to admit, viz., the rupture of some

small artery. The simple cure in such a case is, as Mr. Munro has pointed out, to take a fine-pointed lancet and cut the artery through; the mouths of the severed artery will then contract and the bleeding cease.

The thanks of the Society having been given to Mr. Nicol for his most admirable paper, the meeting adjourned.—*The London Dental Record.*

ARTICLE II.

ARE NOT THE ORGANS CONTAINED WITHIN
THE ORAL CAVITY PARTS OF THE HUMAN
ECONOMY, AND IF SO, HOW CAN THE
TREATMENT OF DISEASE IN THIS
LOCALITY BE CONSIDERED OTHERWISE
ERWISE THAN AS A SPECIAL-
TY OF THE GREAT HEAL-
ING ART, AS COMPRE-
HENDED IN THE
TERM: MEDICINE ?

BY B. MERRILL HOPKINSON, D. D. S., M. D., OF BALTIMORE.

[Read before the Maryland State Dental Association, February 10, 1887.]

In the January number of the *Independent Practitioner*, published in Buffalo, N. Y., a paper appeared, which had been read before the New England Dental Society, by one of the supposed leading men in our specialty in this country, in which he boldly asserts, "Dentistry is not a Specialty in Medicine." I cannot allow such a statement to go unchallenged, and while I am sure there will be many men far more able than I, who will satisfactorily answer his

paper, I feel it my duty as a graduate in dentistry and in medicine, as a dentist and as a specialist in medicine, to enter my protest. For *any* individual, be he ever so stupid concerning matters of general education, who had given any time or thought to the relationship between the various branches of medical science, to make such a statement would surprise me, especially if he were to do so after maturing in that portion of his anatomy, he is pleased to call his brain, such ideas as he might have power to bring to bear upon this subject; I say for such an individual to make such an assertion would be a matter of great surprise to me, but, for a man who has the natural ability and talent, to which may be added superior opportunities for advanced study and learning as the gentleman of whom I speak, for such a one to make such a blunder, I can only say that it is most extraordinary and incomprehensible. What can be the reason, in the name of all that is good, for such a course on the part of our distinguished brother? In glancing at his paper I find that he adds only the honored degree of D. D. S., to his name, and the presumption is that he is not a doctor of medicine. Now as a matter of course a man cannot *properly* be a practitioner of medicine or any department thereof, unless he bears the distinctive degree of M. D., and a man is not in the fullest sense a specialist in medicine unless he has legally been made a doctor thereof. This is a positive reason doubtless, why the doctor does not regard himself a specialist in medicine, and so far as he is individually concerned, we will grant him his supposed honor of not being one. Can any man then who is not an M. D. be regarded as a specialist in medicine? Strictly speaking he cannot, but because any individual has not the time or inclination to become an M. D., it does not follow that dentistry in its highest sense and application is not a true department of the great healing art, and I will endeavor to show that it is as much a department of medicine as ophthalmology, otology, laryngology, or any other department, all of which are acknowledged by both profession

and laity alike to be specialties. The eminent gentleman should indeed receive the felicit approbation of all men for his happy frame of mind, for while he says he is not in *any sense a specialist* in any science or art, he feels that he is master of a profession far out rivaling all others in magnitude, and scope for doing the greatest good, a connection with which will elevate all who enter its sacred councils, one demanding for its proper practice a knowledge of all the arts and sciences; and more than all, should any other branch of science, more especially medicine, by some happy combination of circumstances become associated with it, such association would be the means of elevating and placing medicine upon the same glorious pedestal where it would shine grandly, but only by reflected light. We congratulate the doctor most heartily and wish him many years of continued and unalloyed happiness in the possession of his *theory* which he so ably advocates, but while we vouchsafe him the above wish, we will endeavor to show that his premises are false and wholly untenable. What is the reason that there should exist at the present time *the occasion* for asking the question, is dentistry a department of medicine? That question can be answered most easily, but in order to do it I must take you back, for a few minutes, almost half a century. There are at this day living witnesses to the fact that before Chapin A. Harris, M. D., founded the Baltimore College of Dental Surgery, he made mighty efforts to have regular chairs of dental surgery established in the faculty of the medical department of the University of Maryland, so that the science and art of dental surgery might not be separated from its parent, medicine, but he made at its birth, so to speak, a special department thereof. Dr. M. A. Hopkinson, who has grown gray in the practice of his chosen profession, was a cotemporary, indeed he was a private student and personal friend of Dr. Harris, and he is my authority for the above statement; indeed the fact is so well known, that I hardly need cite an authority. It is very evident that Dr. Harris recognized

the fact, *almost fifty years ago*, that dentistry was a department of medicine, but being denied admission to the medical faculty of the University, and being a man with firm convictions and an established purpose, there was nothing left for him to do but join with his colleagues and found a separate school of learning, the necessity for which he sadly deplored. We will admit that their action and work were noble, that the results have been grand, but who can tell how much grander the results might have been had their first proposition been carried out as intended. What shall be said of the medical faculty of that day? Let us pass their action by in silence, or content ourselves with saying that perhaps the time was not yet ripe; indeed we can truly say the full harvest *is not yet* to be gathered, and *will not be* until the time shall come when there shall be no separate dental schools, but when all men who propose to limit their practice to the diseases of the oral cavity shall be regularly educated as doctors of medicine, which shall be the only degree necessary for all branches, taking at the same time such special instruction as will be needful for them successfully to practice their specialty, and in addition to this, such post graduate courses as may be requisite, doing in fact as other students do, who study and practice other specialties. So much for the original places for which dentistry was intended.

I will venture a prophecy just here, and while I am not gifted in the matter of foretelling coming events as were some of the ancient prophets, I believe I have enough of the gift of prophecy to be able to forecast the coming of such a happy time as I have portrayed concerning the education of our future dental specialist. I sincerely trust that I may live to see the day; if I do, I will with Simeon of old chant my Nunc Dimittis and lie down to rest in peace. I have shown you gentlemen why there exists at this time *the occasion* for a difference of opinion concerning the proper place for dentistry, and we will see if the original idea of its founders, as a science and art, are not as true today as they

were nearly fifty years ago. Let us look at the title of my paper. It reads: Are not the organs contained within the oral cavity parts of the human economy, and if so, how can the treatment of disease in this locality be considered otherwise than as a specialty of the great healing art, as comprehended in the term: medicine? How absurd it seems as a matter of fact, *of fact* I say, not because of a semi-established precedent or by force of circumstances, for us to take the organs of incision and mastication, insalivation and deglutition, make a special study of them, combine with this a hurried and perfunctory study of certain other parts of general medicine, add to this a certain amount of mechanical study and manual dexterity, go through the form of a final examination, receive a diploma and then feel that we are prepared to practice a department of the great healing art, in short feel that we can take just as much of the human body as we see fit, study those parts, separate them from the whole, and from a distinct profession! To me there can be nothing more absurd, and such a profession so-called; and so acquired, is to my mind on a par with that of the corn doctor, the pile doctor, and those worthy gentlemen who proclaim to the world their ability to perform all sorts of wonders in the way of curing all diseases of a private and painful nature. Gentlemen, the day for that sort of thing is past and gone, and we should all devoutly thank God for it. The student of this day and generation, in our University Departments at least, is required to have as good an education in anatomy, physiology, materia medica and therapeutics, as the student of general medicine, and he is required as well, to pass a similar examination. What a wonderful stride toward the fulfilment of my prophecy! Far be it from me to wish to derogate one jot or tittle the high standing of my Alma Mater in dentistry, but to show how the curriculum of the student is altered, comparing then with now, I will make a few comparisons. My professor of chemistry in my dental course was also my professor of materia medica and while he was endowed with

many characteristics of both scholar and gentleman, he was so unfortunate as to be too fond of the brewings of the jolly god Bacchus; was often absent, and frequently, when present, was not in condition to instruct a class of students. I think I can truthfully say, I did not hear a lecture on *materia medica* during my dental course, or at least not from that chair, and what I learned of this branch of study was mainly from individual labor. My professor of anatomy was also my professor of physiology, and while he labored faithfully and earnestly to do his duty, a most unprejudiced observer will see that the field is far too vast for one man to accomplish a satisfactory result in either branch. Look with me at these branches as taught in our University. Each one is in the hands of a competent professor, a man standing deservedly high in his special chair and each dental student has the same opportunities as the students in general medicine, and not only has he the same opportunities, but he is obliged at the end of his course of study to be *as proficient*. I speak of these things to show you what a grand advance has been made and to ask you if such a change has taken place in seven years, what may be, nay *what are*, not only the possibilities, but the probabilities, for the succeeding fifty years? I have shown that the fundamental branches of medicine are taught to medical and dental students alike, and I contend that the day *will come* when the *theory* of the principles and practice of dental surgery will be added to the curriculum of the medical student, just as soon as the other branches of general medicine are added to that of the student of dental surgery. I shall be very glad if Dr. Kingsley or any other gentleman will simply answer the question as contained in the title of this paper. To me it appears unanswerable and I cannot understand how the proposition, as expressed, can fail to be subscribed to by all reasonable and sensible men. His paper reads to me like the production of an individual who had been, for some reason or other, snubbed and trodden upon by some weak, bigoted, narrow minded man or men,

owning the title of M. D., and I am sorry to say there are many such, and instead of laughing to scorn such silly and puerile attempts at the assumption of greatness, he allows the attack to sink deep into his heart, and as a supposed revenge, vents his spleen upon the whole profession, by seeking to belittle it in the exaltation of his pet, "the dental profession" using shall I call them arguments, to prove that the study and practice of a grand department of the great healing art is a separate and distinct profession; merely by reason of certain fortuitous circumstances, in a more bigoted and less enlightened age, those who had the power and privilege of admitting us to their councils, declined so to do, and forced us to establish schools of our own. I also am proud of my chosen department of practice, proud in the thought of its present exalted position, proud of the good I have accomplished in a modest and quiet way, in the treatment of my fellow beings in distress, and most happy when I look forward and think of the possibility of my accomplishing greater things in the time to come, but I say frankly I was not satisfied with having acquired simply a degree in dental surgery, highly honored as it is, although I labored faithfully and conscientiously during my college course so that in the end I might feel as though I had earned it, and I am sure I derived all the benefit it is possible for a student to derive from such a course of study. I say I was not satisfied, so I immediately began to think of obtaining my degree in medicine, which in due course of time I did obtain from our old and honored University; and in so doing realized all my past ideas of what a true dental specialist should be. There is naturally a division at this time, upon the subject under consideration, and all those interested may be placed in one or the other of the following classes; first, those firmly believing dentistry to be a true department of medicine, viz: graduated doctors in medicine, with perhaps here and there an exception; and second, those equally firmly holding opposite tenets, viz.: non-graduates of medicine; and yet, there are *many* men who occupy positions in the latter

category, from force of circumstances, or other reason, who *do* feel that they practice a branch of medicine, for the reason that they fully agree with my proposition, viz.: the title of this paper. In the pursuance of this subject, whatever side we take in the controversy, I beg that, whatever may be said will be devoid of slur and sarcasm, and had Dr. Kingsley omitted much of his article written in this vein, he would doubtless have been read with greater attention and interest. In conclusion, and I fear I have occupied your attention beyond the limit of patient listening, and yet have not said all I desire. I will call your attention to an advertisement upon the last page of the *Maryland Medical Journal*, headed, University of Maryland, School of Medicine. Then follows the word Faculty. Among the list of names, to be found in that faculty, are those of the professors who are specially engaged in teaching those branches pertaining to the study of dental surgery. Why are those names there?

Is it a straw which shows the direction of the whirlwind, the first gentle breezes of which are only now felt, but which in time will come in all its grandeur and might to sweep away all dissension and difference of opinion, driving from the minds of those who are unable now to comprehend or grasp the situation, the mist of uncertainty, which hangs before them like a fog before the eyes, leaving the horizon clear and bright, when will be seen our grand and noble department, not standing alone, but after many years of toil, ever upwards, placed once for all in its unity within the fold, and as a true and worthy child of its rightful parent medicine?—*Maryland Medical Journal*.

ARTICLE III.

MIRROR TOPPED SYPHON TONGUE HOLDER.

INVENTED BY DR. D. GENESE, BALTIMORE, MD.

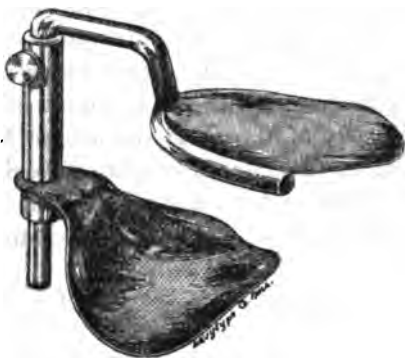
In preparing cavities in the lower jaw where a copious flow of viscid saliva is present, much time is lost and great inconvenience is felt by patient and operator. Absorbents

fill the mouth and soon get useless and a pipe syphon irritates the tongue and keeps it continually rolling into the cavity one wants to prepare, while just as the patient is in a good position, the necessity occurs to empty the mouth and the operator loses precious time.

The rubber dam in such cases consumes much time, is often defective and moisture accumulates so fast under it that the patient gets distressed and often the clothes spoiled by the escape of saliva under the dam.

It is also a recognized fact that a plentiful supply of warm water to syringe cavities, getting rid of debris from the undercuts is the dentist's greatest safe-guard from troublesome marginal defects found so soon after completing fillings in mouths filled with viscid saliva, which almost glues the debris to the dentine. The posterior operations require good reflected light which cannot be obtained when the mouth is filled with cloths or rubber.

Patent Applied for.



This instrument enables such operations to be performed rapidly and with less fatigue to patient and operator. It keeps the tongue out of the way; shows a fine light upon the teeth and carries all fluid away as soon as formed on the floor of the mouth.

Under anæsthesia it will relieve the patient from the distress of swallowing the blood, the same in operations on

cleft palate, or in spraying the fauces where the desire to swallow occurs almost as soon as the operation commences. It enables the dentist to have the cavity ready for plastic fillings before mixing the material and not to hurry the manipulation, thereby destroying its working properly by too much haste while the material is being introduced, and it *leaves both hands at liberty* without the fear of the tongue getting in the way.

It is made of german silver, nickle plated and highly finished, with three sizes of depressors, which will be found all that is required. It is easily kept clean and is rapidly handled. It can also be worked with a ball syringe, but a flow of water is preferred. It will syphon a pint per minute if desired, and by the arrangement of the inlets no undue pressure is felt on the soft tissues or the tongue during the operation. Its capacity has been tested in many cases, in one of which the patient retained it in the mouth from commencement to finish of three large crown fillings, taking two hours, during which time the head was not removed from the rest of the chair. For operations in children's mouths nothing can equal its usefulness in certain cases, and used in connection with the speculum shown at the State Dental Society of Maryland and also in New York, it will enable dentists to facilitate hitherto difficult operations, making them easily and quickly accomplished with better results than with the old method of operating in small mouths with excessive flow of saliva.

ARTICLE IV.

DENTAL JURISPRUDENCE.

BY RICHARD GRADY, D. D. S.,

Since the publication of my article on "Dental Jurisprudence, January, 1884, the following additional cases have come into my possession, which I now print as a sup-

plement to the twelve cases therein noted. Several of these prove the importance of dentists keeping specific records of their dental work. My plea then that "Dental Jurisprudence should have not only a name but a local habitation" has been recognized, and there will be issued before June, 1887, "The American System of Dentistry" in three octavo volumes, volume III embracing *Dental Jurisprudence*.

RICHARD GRADY.

(Doctor of Dental Surgery.)

13. *Identification of the Prince Imperial*.—The occurrence of the Prince Imperial's death has revived a question which has been somewhat neglected by lawyers and physicians, viz: the importance of the teeth as a means of identification of deceased persons. The late Prince Imperial had been so much disfigured that identification would have been extremely difficult but that the Prince had had four small cavities in the first molar teeth filled with gold by Dr. Rotenstein, of Paris, and had met with a slight accident in April, 1876, from a blow on the front teeth, which had made it necessary to fill the teeth a little in order to smooth the enamel. These constituted signs which are unalterable even by ages; and, as careful dentists keep usually a record of such operations, as they afford a means of identification which is unerring, and which, as in the present instance, was of great value, and might, under certain circumstances, be of highest importance.

14. Miss Nellie D. Cooley, of Wilkesbarre, Pa. who disappeared in so mysterious a manner from her home on December 9, 1883, was found May 27, 1884, after a lapse of five months, in the Susquehanna River. The remains were so badly decomposed that all identification by general appearance was impossible, until Dr. C. S. Beck, dentist, of the above named place, was called as a witness by the coroner's jury, and he positively identified the remains by the structure of the teeth and the fillings he had inserted in some of them. So much for dental science.

15. "If you saw the man who bit that orange, would you be able to recognize him?" said an officer to me once. A robbery had been committed in a house, and the robber had bitten into a hard sour apple he found on the centre-table, and had then thrown it on the floor.

"Yes, I think I could," we replied; "and I believe I can so describe him to you that you can identify him. He has large upper central incisors, the front edge of the left one is turned out a little. The left lateral is gone and the right lateral is twisted nearly half way round. That man I believe was in my office a month since and had a little work done. Let me refer to my chart book.—His name is Mr. ———, and I filled three ———."

"But Doctor," interrupted the officer, "the young man you name is entirely above suspicion. It can't be he."

But it proved to be he, and he was sent to State's prison for the offence.

16. *The Teeth from a Medico-Legal Aspect.*—The identification of dead bodies and criminals is sometimes a matter of much perplexity. For instance; the features of a dead body may be distorted or destroyed; the clothes changed or unrecognizable; and no ordinary circumstances left to make identification clear. Some such a case occurred in Michigan. A man was found in a lake murdered. As the coroner was about dismissing the case as "unidentified," the neighboring dentist had the curiosity to look into the mouth. In a moment he said, "I have a chart of that mouth in my office," and though he could not then remember the name, he soon found it by referring to his chart book. It resulted in tracing the murderer,

17. *Twenty Years After. An Iowa Doctor discovers the remains of his Brother.*—A very remarkable case of the finding and identification of the remains of a Union soldier twenty years after he fell has just come to light. During the war a brother of Dr. Conoway, of Des Moines, Iowa,

enlisted in a Pennsylvania regiment and went to the front. He was engaged in most of the battles of Virginia, and finally fell before Lynchburg. He was buried without being recognized, and appeared on the muster-roll after the battle as "missing." Young Conoway, so far as the family could learn was seen to fall in the front of a charge against the breastworks, and then all track of him was lost. The war passed by, and, despite the most careful inquiries, no trace of the boy could be found. Last month Dr. Conoway attended a national medical convention in Pennsylvania, and when its sessions had closed, extended his journey into Virginia in search for the remains of his soldier brother. After visiting many battle fields, he finally came to Lynchburg and there discovered a man who had been a member of the same regiment as the deceased, and who had seen him fall. This young man had been a member of the burial party. Young Conoway had not been buried in the trenches, but in a separate ground on a hillock near by, which, the man said, he thought he could recognize. Adding him to the searching party, the battle ground was carefully scoured and the lone grave discovered. Of course the flesh had disappeared, but from a peculiarity of the teeth Dr. Conoway was fully able to identify the remains. Among the remnants of clothing was found a small phial tightly corked, inclosing a slip of paper, on which was written his brother's name.

18. *The St. Louis trunk Tragedy.*—The relatives of C. Arthur Preller, who was killed by Maxwell and his body packed in a trunk at the Southern Hotel, recently discovered a receipted bill among his effects by which they ascertained that Dr. Burnette, of San Francisco, had filled his teeth in March, 1878. They wrote to Dr. Burnette, who referred to his books, and then replied that he had filled teeth for Preller. The counsel for Mr. Preller's family in the suit they have brought to recover the insurance on his life, has written to Dr. Burnette to learn what work was done on

Preller's teeth. When he receives the information he intends to have the body exhumed and the teeth examined. It is believed the testimony thus secured will be very important, not only in the insurance case, but in the trial of Maxwell for murdering Preller.

19. *A Massachusetts Mystery. Detectives seeking for the Murderer of the Body found at Wrentham, Mass.*—The excitement over the finding of the skeleton of a woman in a field in Wrentham is still spreading in that neighborhood. The medical examiners have carefully looked over the skull and find that the ball passed completely through it, indicating that the shot was fired by some one who sat or stood at her right, and that by no means could she herself have used the weapon,

Last evening it was seen that the upper teeth were false, and that there was a small gold-filling used to give the set a genuine appearance. They were of superior workmanship, and were undoubtedly made by a city dentist.

20. *Miss May Hatch. The Identity of the Body.*—Miss May Hatch, of Baltimore, went to Norfolk, Va., June 16th, 1886. From there she took the steamer for Boston, and when on the ocean, it is claimed, committed suicide by drowning. To perfectly establish the identity of the remains of Miss Hatch, Dr. Norris, of North Charles street, the family dentist, examined the mouth and teeth of the body the morning before burial. The young lady had been at various times under his professional treatment. Comparison with diagrams in the doctor's possession left no room for doubt regarding the identity of the corpse.

21. Once more, at Paris, the impossible has happened. The case of Madame Menetret, the retired French milliner, who was mysteriously murdered at Villemonble, but whose assassin had long eluded the closest search of the police, has just evolved a new feature, which is surprisingly like

that which, a generation ago, at Boston, identified Professor Webster as the slayer of Dr. Parkman. An artificial tooth has been found, the dentist who made it has sworn that he fitted it to the mouth of Madame Menetret, and the place where it was discovered and the attendant circumstances affix, with what looks terribly like certainty, the commission of the crime upon a woman named Euphrasie Mercier. This, it will be remembered, is precisely what occurred in the Webster-Parkman case, and the counterpart to the incident which established the guilt of Webster, who was hung for the crime.

ARTICLE V.

—THE NINTH—

INTERNATIONAL MEDICAL CONGRESS,

WILL BE HELD AT

WASHINGTON, D. C., September 5th, 1887.

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N. S. DAVIS, M. D., LL. D.

Secretary General :

JNO. B. HAMILTON, M. D., of U. S. A.

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Dr. A. O. Hunt, Iowa City, Ia.
Dr. R. Findley Hunt, Washington, D. C.
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Dr. James Lewis, Burlington, Vt.
Dr. James McManus, Hartford, Conn.
Dr. W. N. Morrison, St. Louis, Mo.
Dr. J. Hall Moore, Richmond, Va.
Dr. T. T. Moore, Columbia, S. C.
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Dr. C. A. Stockton, Newark, N. J.
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Dr. W. C. Wardlaw, Augusta, Ga.
Dr. J. W. White, Philadelphia, Pa.

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Dr. Edgar Palmer, LaCrosse, Wis.
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Dr. L. D. Shepard, 100 Boylston St., Boston, Mass.

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Dr. W. W. H. Thackston, Farmville, Va.

Dr. E. A. Bogue, 29 E. 20th St., New York City, N. Y.

Dr. F. H. Rehwinkel, Chillicothe, O.

Dr. C. F. W. Boedecker, 60 E. 58th St.,
New York City, N. Y.

Permit the following suggestions. It will be the duty of the Reception Committee to receive and welcome the Foreign Guests and Visitors; and to facilitate their introduction to, and acquaintance with, the members of the Profession in this country, and to promote the social features of the occasion. It is hoped that, through this Committee, an acquaintance will be effected throughout the entire membership of the Section.

Committee on Operative Dentistry and Oral Surgery—Clinics.

Dr. C. F. W. Boedecker, 60 E. 58th St.,
New York City, N. Y.

Dr. J. A. Watling, Ypsilanti, Mich.

Dr. R. L. Cochran, Burlington, Ia.

Dr. F. Abbott, 22 W. 40 St., New York City, N. Y.

Dr. W. C. Wardlaw, Augusta, Ga.

Dr. J. D. Patterson, Kansas City, Mo.

It will be the duty of this Committee to make ample provision for the work of this department, providing all

needed facilities, such as chairs, engines and all appliances: to provide patients and subjects for the Clinics; to confer with the operators, learn their needs, and supply them so far as possible.

There will be others added to this Committee as the work may require.

Committee on Prosthetic Dentistry.

Dr. Geo. L. Field, Detroit, Mich.

Dr. H. B. Noble, Washington, D. C.

Dr. A. O. Hunt, Iowa City, Ia.

Dr. John Allen, New York City, N. Y.

Dr. T. T. Moore, Columbia, S. C.

Dr. W. N. Morrison, 1337 Washington Ave., St. Louis, Mo.

Dr. R. B. Donaldson, Washington, D. C.

It will be the duty of this Committee to provide facilities for the work of this department, and arrange for its efficient performance; and make such regulations as shall secure the greatest benefit from the demonstrations.

ORGANIZATION.

The following rules and regulations have been adopted by the Ex-Committee, for the guidance of the work of the Congress, and of its sections.

The Congress will consist of such members of the regular medical profession, as shall have registered, and taken their ticket of admission, and of such other scientific outmen, as the Executive Committee of the Congress shall deem it desirable to admit.

Books for registration of members, will be ready on and after September 1st, 1887, and on each subsequent day during the session. Any member desiring registration prior to this time, may apply by letter to the Secretary General, and forward his dues with his full address, when a receipt will be returned.

The membership fee, for residents of the United States, will be (\$10.00) ten dollars; there will be no dues for mem-

bers from other countries. Each member will be entitled to receive a copy of the transactions of the Congress, when published by the Ex-Committee.

The work of the various sections will be directed, by the President of the section, and the order will be published in a daily programme for each Section.

Brief abstracts of papers to be read in the Sections, shall be forwarded to the Secretaries of the proper Section, on or before April 30th, 1887. These abstracts shall be treated as confidential communications. Papers relating to topics not included in the lists of subjects proposed, by the officers of the Sections, may be excepted after April 30th, 1887.

The officers of each Section shall decide as to the acceptance of such proposed communications, and the time for their presentation.

The Ex-Committee cordially invites members of the regular Medical profession, and men eminent of the *Sciences, collateral to Medicine, in all countries*, to participate in person, or by papers, in the work of this great humanitarian assembly.

The attendance of medical students, and others interested in the work of the various Sections, or in the general addresses delivered in Congress, will be permitted on the recommendation of the Secretary General, or by the officers of a Section, on their taking out of the registration committee a general ticket of admission fee, one dollar; such persons cannot take part in the proceedings.

All communications and questions relating to the special business of any section, must be addressed to the President, or one of the secretaries of that section.

Officers of Sections, and Their Duties.

The officers of each section, including foreigners shall shall be a *President*, not less than five *Vice Presidents*, four *Secretaries*, (two foreign) and not less than ten, nor more than thirty, members of council.

President.—The President of each section, shall be its executive officer, who is solely responsible for the efficient work of his section. He shall nominate all persons to the Ex-Committee, for any office connected with his section. He shall select and regulate (by conference where desired, with the other officers of his section), all papers or questions for discussion and reject only after such conference, such papers or questions, as he may deem inadmissible to the transactions, or for presentation in his section. He shall preside at, and regulate the business of each meeting of his section, punctually at the hour named, making an opening address to the section, if he so desires. He may at any time adjourn the session of the section, when in his opinion sufficiently long, as when there are too many papers for the day, etc., etc. He shall strictly enforce Rule 8 of the preliminary Organization. When a paper is read, or discussion occurs in a foreign language, he shall resign the chair to a foreign officer of the same nationality as the language employed.

Vice-Presidents.—They shall assist the President in the performance of his duties at each meeting of the Section when requested by him, and shall take their seats on each side of the presiding officer. They shall aid the President in consultation on the value and character of all papers or discussions that are to be presented in the Section or the transactions.

Secretaries.—The four Secretaries of Sections shall arrange among themselves, or at the request of the President of the Section, the order of their duties. They shall keep accurate records of the proceedings of each day in their Section, and make such daily report of it to the Congress, as the President of the Section shall direct; the foreign Secretaries acting for their own nationalities. At the close of the session they shall present all their minutes, in good order, to the Secretary General for publication in the Transactions, if so desired by the Executive Committee.

Members of Council.—It is expected that the Members

of the Council will aid in every way to make the Sessions efficient and instructive. They will also be expected to advise with the President on any matter pertaining to the work of the Section, and on questions which may arise in connection with the publication, in the transactions of papers read, or discussion had in the Section.

Editorial, Etc.

UNIVERSITY OF MARYLAND, DENTAL DEPARTMENT.—*Annual Commencement for 1887.*—The commencement exercises were held in the Academy of Music, Baltimore, on Wednesday, March 16th, 1887, in the presence of a large audience. The exercises opened with prayer by the Rev. Dr. Julius Grammer, of St. Peter's P. E. Church.

The Mandamus was read by the Dean, Prof. Ferdinand J. S. Gorgas, M. D., D. D. S. The degree of "Doctor of Dental Surgery," was conferred upon the following gentlemen, *fifty-one* in number, by the Hon. Severn Teackle Wallis, L. L. D., Provost of the University.

JULIUS ALBRECHT.....	GERMANY
JOSEPH MABEN BAKER.....	ARKANSAS
ALONZO AMASA BEMIS.....	MASSACHUSETTS
DANIEL B. BLAUVELT.....	NEW YORK
GARABED BOYAJIAN.....	ASIATIC TURKEY
CHARLES J. BRAWNER.....	GEORGIA
HENRY E. CHASE.....	MASSACHUSETTS
JOHN G. CHISHOLM.....	ALABAMA
FRED. JULIAN CROWELL.....	NEW HAMPSHIRE
HENRY E. DOUGLASS.....	NEW YORK
JOHN TRIPNER EIKER.....	DISTRICT OF COLUMBIA
GEORGE McCLENAHEN FAULKNER.....	PENNSYLVANIA
W. CRAWFORD YOUNG FERGUSON.....	CANADA
CHRISTIAN G. FRANTZ.....	PENNSYLVANIA
JOEL NELSON FURMAN.....	NEW YORK

HEINRICH GARBRECHT.....	GERMANY
WILLIAM F. GRAY.....	VIRGINIA
L. LEE HARBAN.....	MARYLAND
EDWIN L. HARRIS.....	MASSACHUSETTS
ANTON JOSEPH HECKER.....	GERMANY
SAMUEL W. HOOPES.....	MARYLAND
HAMILTON V. HORTON.....	NORTH CAROLINA
MICHAEL HOURIHANE.....	VIRGINIA
MAX JAENICKE.....	GERMANY
PAUL JAENICKE.....	GERMANY
JAMES LEITCH KEAN.....	VIRGINIA
CHARLES T. LOVING.....	TEXAS
WILLIAM M. MEADOR, M. D.....	SOUTH CAROLINA
SAMUEL MCCOLL.....	CANADA
JAMES H. A. MILLER.....	WEST VIRGINIA
WELLINGTON C. MILLER.....	PENNSYLVANIA
WOODSON N. MURPHY.....	TEXAS
JOHN H. NEILL.....	NEW YORK
ALBERTO LOPEZ DE OLIVEIRA.....	BRAZIL
HARRY HOMER PHILLIPS.....	PENNSYLVANIA
PRESTON A. RAMBO.....	GEORGIA
SAMUEL S. REAMER.....	VIRGINIA
WALTER FRANKLIN RICHARDS.....	ILLINOIS
WILFRED A. ROBERTSON.....	CANADA
CARY CLIFTON SAPP.....	NORTH CAROLINA
EDWARD H. SHIELDS.....	OHIO
HENRY RUTGERS SHINE.....	FLORIDA
RICHARD ALEXANDER SHINE, JR.....	FLORIDA
E. EVERETT P. SLEPPY.....	PENNSYLVANIA
PARKE P. STARKE.....	VIRGINIA
ROBERT W. TALBOTT.....	DISTRICT OF COLUMBIA
MATHEW W. WHITE.....	SOUTH CAROLINA
ARNOLD WIETFELDT.....	GERMANY
HEINRICH THEODOR WILHELM.....	GERMANY
JOHN H. WILSON.....	NEW YORK
WILLIAM W. WOGAN.....	PENNSYLVANIA

Mr. Wallis gave the graduates some very good, solid advice. He also awarded the prizes, as follows: University prize, for highest number of votes at final examinations, to M. Hourihane; honorable mention to W. C. Miller. S. S. White prize, for best two fillings of cohesive and non-cohesive gold foil to Preston A. Rambo; honorable mention to Henry E. Chase. Snowden & Cowman prize, for best set of continuous gum to H. H. Phillips; honorable mention to E. H. Shields. S.

White prize, for best partial set of teeth on metal, to M. Hourihane; honorable mention to J. L. Harban. Francis Arnold prize, for best full upper set of gum teeth on metal, to R. W. Talbott; honorable mention to W. F. Richards. Dr. Frank L. Wood prize, for best cohesive gold filling, to C. C. Sapp. Dr. James H. Harris prize, for best non-cohesive gold filling, to Hamilton V. Horton; honorable mention to D. B. Blauvelt. Dr. F. J. S. Gorgas prize, for best crown or bridgework, to Paul Jaenicke; honorable mention to Charles T. Loving. Dr. John C. Uhler prize, for best combination set on rubber or celluloid, with soldered rim, to Max Jaenicke, honorable mention to A. J. Hecker. Dr. Charles L. Steel prize, for best specimen tooth filling, to R. W. Talbott. Dr. B. H. Catching prize, for best examination in dental materia medica and therapeutics, to M. Hourihane, honorable mention to W. C. Miller.

An address was delivered by Rev. A. C. Dixon, D. D. He said: "I beg of you or a few minutes what you will be seeking all your lives, 'patience.' There is a close relation between dentistry and religion; it is a hard thing for ministers to give consolation to dyspeptics, neuralgics and toothachists, and we wish to turn all such people over to you. There is also a relation between dentistry and crime: it is said that when the east wind blows crime increases about 15 per cent., but when toothache is raging it increases about 40 per cent. It is also said there is a relation between dentistry and matrimony. A man comes home irritated with his business affairs and meets his wife, irritated with a bad case of jumping toothache, and then comes the quarrel from which the divorce court lawyers make money. If you have anything tender to say, don't say it to her who hath the toothache. Drunkenness is often brought on by the toothache, and so is the opium habit. People take whiskey and opium to kill the pain when their teeth are aching, and continue the use of these for fear their teeth may ache again. And now we invite you to become a member of the fraternity. If you believe in religion, temperance and matrimony, be good dentists. It will be your business to fill, and be sure to fill with the right sort of material, and in proportion to the knowledge that fills your heads.

Teeth come solid and become hollow. Heads come hollow and have to be filled. Acquire knowledge, and be wise enough to use it; but don't think you know more than you do. A wise fool is the worst sort of a fool. I recommend tender nerves and pulp for conscience, and enamel for will; but I know of some dentists who have wills of pulp and consciences of enamel. Have sound and permanent convictions; know what you will do and how to do it. Have faith in your profession. Faith is powerful, doubt is destructive."

The benediction was pronounced by Rev. Dr. Grammer, and the audience dismissed.

The number of Matriculates for the session of 1886-87 was *one hundred and twenty-four*.

The fifth annual banquet of the Alumni Association was held in the evening at the Howard House. Officers for the ensuing year were elected, as follows: Dr. R. S. Dodson, president; Dr. Elmer J. Wisherd, vice-president; Dr. J. S. Kloeber, secretary; Dr. J. R. Davis, treasurer. The annual address was delivered by Dr. F. J. S. Gorgas, dean of the school. About one hundred persons were present.

THE FIRST COLORED DENTAL SCHOOL.—*The Meharry Medical Commencement*.—The eleventh annual commencement of the Meharry Medical Department of Central Tennessee College, and the first commencement of the School of Dentistry, were held at Masonic Theater, Nashville, Tennessee, February 21st. Every available seat in that large building was filled, while hundreds could not gain admission; and yet perfect order reigned in the audience, some of whom were white citizens of Nashville, who are becoming interested in this work. Among those seated on the stage were the Governor of Tennessee, State Superintendent of Public Instruction, Secretary of the State Board of Health, Mr. Robert Blackstock and Mr. Frank Meharry, of Illinois, Hon. R. P. Yancey, Hon. E. I. Golliday, Hon. Dr. Harwell, Col. A. S. Colyar, Speaker Ewing, of the State Senate, and many members of the General Assembly of Tennessee, and a number of leading citizens of Nashville.

The salutatory oration was delivered by Rev. W. A. Sinclair. His subject was "The March of Medical Science." He traced the history of medicine from the earliest ages down to the present time, in pleasing language and intelligent manner.

The valedictory, by J. W. Pickett, on "The Diseases of the Heart," was well delivered. In conclusion he referred very feelingly to their gratitude to those who have shown an interest in the elevation of the race. He said: "There are some hearts which are grateful unto death; let not a shade of doubt ever come to divert your interest from us; feel not that the Negroes are ungrateful for what has been done to help them."

The valedictory was followed by the charge to the medical department graduates, by G. W. Hubbard, M. D., Dean of the College. He gave a short history of the growth of the Meharry Medical College. At the time it was organized, the question of educating Negro physicians was a new and unsolved problem. He said: "Eleven years ago this work began in one small room, without money, apparatus, or experience, and with only a handful of students. We have now a handsome building with ample grounds and growing accommodations, from which we have sent out sixty-two graduates besides the present class. At the beginning of this term a school of dentistry was opened, which is the first and only colored dental school in the South and for which we are very much in need of a suitable building."

The address to the class in dentistry was delivered by W. H. Morgan, M. D., D. D. S., dean of the Dental Department of Vanderbilt University. Dr. Morgan gave an interesting history of dentistry, going back to the time of Herodotus, who spoke of it in connection with medicine in Egypt. The degree of M. D., was then conferred by President Braden on ten young men, who had finished their course in medicine, and three received the degree of D. D. S.

Governor Taylor was called for, and, in response, said he had not come there to make a speech, but to show these young men his deep interest in their welfare by his presence; that their race was preparing to fight the battle of life, and that they were the advance guard of the civilization of their

people. "Lift your race into a higher plane," he said, "that we may go on together to a grand and glorious future."

His remarks were followed by short speeches from Superintendent Payne; Secretary of Board of Health J. B. Lindsley, M. D.; A. S. Colyar, editor of the *Nashville Union*, and Mr. McElwee, one of the colored members of the General Assembly.

Nine dental and fifty four medical students have been enrolled the past session.

It is a most encouraging sign of future success, when a Governor of a Southern state, the editor of one of the leading public journals, and a dean of a department of Vanderbilt University favor an occasion of this kind with their presence and words of encouragement, and the leading daily paper of the city devotes an entire page to the report of the exercises, as the *Nashville American* did of this on February 22d.

INTERNATIONAL MEDICAL CONGRESS — *Section of Dental and Oral Surgery*.—Dr. E. A. Bogue, Secretary, 29 East 20th street, New York City, desires all who will assist in the Dental and Oral Section, to furnish him with an abstract of their papers, or the papers themselves, at once; as these papers must be in the hands of the Secretary as soon as possible, in order that a definite programme may be arranged, and a proper amount of time apportioned for each subject.

Obituary.

DR. JOHN G. WAYT died in Richmond, Va. February 15th, 1887. He had only been ill for several days and at first no serious results were anticipated. The deceased was in the seventy-seventh year of age, and had spent nearly half a century of that life in Richmond.

He was a native of Charlottesville and came from that place

to this city and established himself as a dentist. He at once secured a large and lucrative practice. He was for many years the leading dentist of the city, and amassed a large fortune as the fruit of his skill and popularity.

During the war he sold much property for Confederate money. He also purchased a farm in Charlotte county and for a time resided there. The war swept away much of his wealth, but he still had a competence.

A number of years ago he retired from active business in favor of his son, the lamented young Dr. George Wayt. The death of this promising young man was a blow from which he never fully recovered. Dr. Wayt was twice married. His last wife was a Miss Greenhow, sister of the City Treasurer of Richmond. This lady survives him. Never were a couple more devotedly attached to each other, and their figures on the streets arm in arm engaged in pleasant and loving converse was a familiar sight, and no two were better known.

The deceased had been for many years a consistent member of the Seventh-Street Christian Church. He was one of the best of men, and needs no word of extended eulogy. A loving husband and father, a faithful friend, a good citizen, an honest man and a consistent Christian, no better or more deserved tribute could be written than this.

In *The State* a short time since in a sketch of the original incorporators of the Male Orphan Society, he was mentioned as the last survivor of the entire number. In this as in all good works he was always interested, and was a contributor.

At a meeting of the Members of the Dental Profession of Richmond, the following resolutions were unanimously adopted:

"The Members of the Dental Profession of Richmond have heard with profound sorrow of the death of Dr. John G. Wayt, whom, at an advanced age and with a name universally crowned with honor and respect by the Citizens of this community, in which he so long resided, it has pleased God to remove from this world. For more than forty years Dr. Wayt practiced his profession in this City and a few men is it allotted to attain such excellence in their chosen life work, or such justly merited honor, and still fewer have done so much to advance the interests of Dentistry. Though incessantly occupied by the cares of

a large practice, he yet always found time to lend a helping hand and give a cheering word to the younger members of the profession, seeking to guide them by the light of his experience in their struggle along the road, over which he had so successfully passed. Notwithstanding the fact, that during much of his life, he was dependent upon his practice for his own maintenance, his gratuitous services were always cheerfully rendered to any in need of them. In whatever position he served to promote public interest or Christian benevolence he never failed to take a most active part.

Therefore be it resolved that in the death of Dr. Wayt, Richmond has lost one of her most valued and public spirited Citizens, and the Dentists their most illustrious exemplar and respected and beloved co-laborer:

Resolved that we hereby tender to the bereaved family of the deceased our sincere sympathies, commending them to Him whose ways are past finding out, but "who is too wise to err and too good to be unkind."

Resolved that a copy of these resolutions be forwarded to the bereaved widow of the deceased."

Monthly Summary.

CHLORAL HYDRATE AS A VESICANT.—Attention has quite recently been called to the vesicant properties of chloral hydrate. According to the *Medical Press*, for blistering purposes, chloral hydrate is fully as efficacious as cantharides, while it is free from the inconveniences attending the employment of this latter agent. The chloral should be reduced to a powder, and a layer of it placed on a piece of common adhesive plaster, taking care to leave a margin between the edge of the layer of chloral and that of the plaster. This is then warmed over a gas jet until the chloral becomes discolored and melts, when it should be immediately applied on the spot

for the operation, the skin covering which is to be anointed beforehand with olive oil or lard. The anæsthetic properties of the chloral prevent any unpleasant sensation, and fifteen minutes is the maximum period of time during which the application may be continued. If the above mentioned precaution be taken of anointing the skin, its vitality is retained, and the presence of an open wound is avoided, the skin adhering again as soon as the exudation is evacuated. Another advantage consists in the absence of the risk of poisonous effects, consequent on absorption, a by no means uncommon sequel to the use of cantharides.

A DEAR KISS.—A short time ago, a Berlin dentist was brought before a magistrate for kissing a young lady after a dental operation. The court considered this action such a grave breach of confidence that they punished him with three months' imprisonment. In America or England, a young lady under such circumstances would have received \$1,000; but, should such a course be pursued in Germany, no dentist would be safe from the visits of ladies anxious to obtain dowries at so slight a cost. Any way, the sentence was not undeserved, for it is of the first importance in our profession that the confidence of the public should remain unshaken.

Some years ago the laws of morality suffered a greater outrage at the hands of a Berlin dentist; and these cases may serve as warning beacons to those engaged in the profession of dentistry.—*Die Zahntechnische Reform.*

INTERNATIONAL MEDICAL CONGRESS.—Prof. J. J. Chisolm of the University of Maryland, has been appointed President of the Section of Ophthalmology in place of Dr. E. Williams, who resigned on account of ill-health. Dr. Judson B. Andrews, Superintendent of the Buffalo, N. Y., Insane Hospital, has been appointed President of the Section of Psychological Medicine and Nervous Diseases, made vacant by the death of Dr. John P. Gray. There are now no vacancies in the list of chief officers of the preliminary organization of the congress or its sections.

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ARTICLE I.

THE GENERAL STRUCTURE OF THE TEETH.

BY DR. CARL HEITZMANN, NEW YORK.

Mr. President and Gentlemen, on March 2 a terrible disaster happened to me and to my family. A beloved daughter of mine, 15 years of age, died of pneumonia. Several weeks of suffering attending and following that calamity broke me down to such an extent that I was quite miserable, both bodily and mentally. Some weeks after this ordeal I went to my dentist, Dr. Bodecker, who had long been familiar with the condition of my teeth, and he said it was perfectly surprising how my teeth had softened down in that short time. I suppose every dentist knows that bodily suffering from an acute disease will soften the teeth in a comparatively short time, in the space of but a few weeks; indeed a very prominent dentist of New York, when I inquired about these matters, told me that he is able to tell by working on the teeth of a lady whether she is suffering from womb disease or not. What does that prove? First, that there is a circulation of matter, speaking in a general way, within the structures of the teeth that is

very much more lively than was supposed up to our time. It next proves that such circulation of pabulum or of matter being present in the teeth, they must be alive through and through. Now is the season of raspberries and blackberries, and it very often happens that a small seed is caught in a pit of the crown of a tooth, and every one of us has experienced the unpleasant, nay painful, sensation produced when the surfaces of the teeth touch such a seed as they glide over each other, and we know that a small hair being caught between the gliding surfaces of the teeth can be recognized as such. There is a degree of sensibility in the teeth that is truly surprising. What does that prove? Where there is sensibility and sensation there is life. Therefore our teeth are composed of live tissues. These are considerations which necessarily urge us to investigate the question: Where is this life located? Which is the substance that is the bearer of life? It cannot be denied that large quantities of both organic and inorganic matter are stored up in the teeth; but there must be something else, which we may call living matter proper, and though we cannot watch and study the changes in its form directly by comparison with other tissues of the body, we must come to the conclusion that we have to deal with living matter. During the last six or seven years this question has been very actively investigated in my laboratory, and I am now giving you a brief outline of the researches made there, mainly by Dr. Bodecker.

As long as the old method was followed, of drying the teeth and making thin slabs for microscopic examination, mounted in Canada balsam, not the least idea could be obtained as to the living matter within the teeth. This, being distributed through the more solid substances of the tooth, it dried out. You could not determine where the living matter was located, and as to its presence or absence we had not the least idea indeed. It is since the method of examination has been changed that we have reached the degree of perfection which enables us to see the living

matter, partly without and partly with the application of certain re-agents. This new method is to soften the teeth by extracting the lime salts with a dilute chromic acid solution, which at the same time preserves the soft tissues or living matter. Another method is to grind a fresh tooth, keeping it moist and preserving the living matter either with chromic or osmic acid. Then if we place a thin section under the microscope we may trace the living matter in it.

Examining the general structure of the teeth we find that there are four varieties of tissue, the main portion of the teeth being composed of dentine, its centre being hollowed out and occupied by a myxomatous tissue, supplied with blood-vessels and nerves, the roots being covered with a structure which we call cementum, and the crown with another structure called enamel. We perceive, by looking at the dentine with a low power, that it is traversed by canaliculi, which were thought to be carriers of lime salts until the discovery was made that they are not only hollow but contain in their centre a solid thread, the dentinal fibre. This latter, curiously enough, was first seen by a draftsman employed by the celebrated Richard Owen, who represented it by a dot in the centre of a transverse section of the dentinal canaliculi, whereas Richard Owen himself does not make any allusion to it in the text of his *Odontography*. It was the elder Tomes who first described these fine threads and he at the same time expressed the opinion that they might be nervous in nature. Though not positive in this assertion, he suggests the possibility of these fibres being nerves, which may account for the very marked sensibility of the dentine. You know that these fibres in the centre of the dentinal canaliculus are not perfectly round, but angular, and are evidently surrounded by some liquid. If we use a re-agent for bringing out the living matter in the different tissues, namely, chloride of gold, we very soon come to the conclusion that this cross section of the dentinal fibrilla is by no means smooth on its circumference, but

that it sends out off-shoots toward the wall of the dentinal canaliculus. Along the periphery of the latter we notice very small perforations, traceable into the basis-substance which surrounds the dentinal canaliculus, and entering into a light, delicate network therein. The basis-substance is far more dense at the periphery of the dentinal canaliculi than at some distance between the canaliculi, a fact first brought to our notice by E. Newman. We satisfy ourselves regarding the fact that the fine conical off-shoots of the dentinal fibre are directed toward the perforations in the wall of the canaliculus, and if we have been lucky in applying the chloride of gold solution—Dr. Williams was so fortunate—we can trace the off-shoots into the dentine and see a delicate reticulum throughout the basis-substance of the dentine. Thus we come to the conclusion that the whole basis-substance is pervaded by an extremely delicate reticulum which exhibits all the properties and characteristics of the dentinal fibres and of living matter. Dr. Bodecker proved the presence of this reticulum without directly proving its being living matter. His proof was indirect, inasmuch as we see in every inflammatory process of the dentine that it breaks down to its embryonal condition, splitting up into the medullary elements from which it grew. What we can say to-day is that the dentinal fibres running from the pulp tissue toward the enamel are formations of living matter, and that the whole basis-substance between the dentinal canaliculi is supplied with living matter too, in short is alive. The meshes of this reticulum contain a gelatinous, glue-yielding basis-substance, which is infiltrated with lime salts.

The dentine is a formation of connective tissue, and kindred with bone. In 1873 I was the first to assert that in the bone tissue not only the bone corpuscles but also the basis-substance is alive. I proved the same in regard to all varieties of connective tissue, which are composed of a continuous mass of living matter, pervading the whole body and not interrupted anywhere. It was an important view, I should say, for the consideration and study of the animal

body as such. Up to that time the notion had prevailed that we are composed of cells, which were thought to be individuals, and that we are built up on the plan of a chimney or a dwelling, in which a number of bricks are set upon each other and stuck together with cement in order to build up the whole organization. With me there are no such cells, no such individual constituents of the body, but there is a continuity of living matter all through. One of the proofs of this view was found in the bone, and later on also in the dentine. This view being novel, and having the tendency to deal of opposition. You know that but very few men are capable of doing some thinking of their own. Most people, speaking in a general way, in any department of science, are scarcely doing more than chew the cud. What is accepted by the majority is considered as a dogma, and is adhered to with an obstinacy perfectly surprising. If a man appears who has no direct adherence to any school, and who tries to prove what he maintains in the laboratory under the microscope, comparatively few people can satisfy themselves of the correctness of his views, or the accuracy of the facts upon which his views are based. That was the case with me and my theories for a number of years; but an excellent histologist in Europe has now, without any hesitation, acknowledged their correctness, namely, Professor S. Stricker, of Vienna, formerly my teacher. Professor Stricker said it took him six years of work before he could satisfy himself of the truth of my assertions. Last year when in Vienna Prof. Stricker showed me some specimens of living tissues, particularly the cornea or anterior membrane which covers the eye, that had been brought to a slight degree of inflammation. If you look at such a specimen of a cornea, without further treatment, you can see the motion of the living matter all throughout the basis-substance. That is a strong proof of the correctness of my assertion that the basis-substance is alive also. The transparent animal tissues, especially the messentery of a freshly killed frog as shown by Prof. Spina, demonstrate the same thing.

It seems, therefore, that so long as we live we are changing the shape of our bodies all the time, either by growth or by locomotion that is going on throughout the tissues of the body. All tissues change their shape and place to a limited degree, and this view would enable us to understand the circulation of the nourishing material, its ups and downs within the teeth, in which we notice great variation in their chemical composition, as before mentioned, even in the space of a few weeks.

The next tissue which interests us is the enamel. Respecting the structure of the enamel, the notion prevailed that it was composed of prisms running longitudinally and obliquely with the axis of the tooth. It was maintained that these enamel prisms lie close against and in contact with each other, there being no interstices between them. Dr. Bodecker proved the existence of narrow interstices between the enamel prisms, and also that these interstices contained extremely minute fibres of living matter; about the same as those in the dentine, only on a very much smaller scale. The enamel fibrillæ which runs between the enamel prisms are extremely delicate to be sure, but they can be seen by the application of chloride of gold, and in temporary teeth even without the use of any re-agent. The younger the teeth the better you can see the course of the enamel fibrillæ. Dr. Bodecker has also shown that these delicate enamel fibrillæ send out off-shots toward the prisms and that the latter themselves are pervaded by a delicate reticulum, very much the same as the dentine. In all probability the enamel is traversed by living matter the same as the dentine. From the moment we become convinced that the enamel is a live tissue all the phenomena mentioned, the sensation which the seed of the raspberry or a delicate hair will produce, become explicable, we are at once in a position to understand that a tissue which is alive and traversed by living matter is endowed with properties of sensation. As we now know that the fibres that pervade the enamel and dentine are very probably in direct connection

with the nerves present in the pulp, there is no difficulty in understanding the transmission of sensation from the periphery of the tooth to its centre.

The third tissue entering into the construction of a tooth is the cementum that covers the root. It is a structure similar to bone, and contains, especially in its lower portions, lacunæ filled with branching corpuscles, similar to bone-tissue and termed cement corpuscles; their off-shoots pervade the basis-substance, producing a continuous reticulum of living matter. What we know to-day to be cement corpuscles were, in previous years, considered as mere lacunæ, the hollow spaces of which send out off-shoots, the so-called canaliculi. The idea prevailed that they contained a liquid holding lime salts in solution. Others maintained that the contents were gaseous in nature. Neither of those theories is correct. Cementum is of the same structure as bone-tissue; its lacunæ contain living matter in the shape of protoplasm, the bone corpuscles, these being the centres from which a certain territory is supplied with living matter too.

What I want to prove, and have proved, is that the three hardest and densest tissues of the teeth, the cementum, the dentine and the enamel, are live tissues, so long as the tooth is in connection with the living organism; so long, at least, as the central part, or pulp, is present, in which we know there are a great many nerves and blood-vessels. If the pulp be destroyed, we have still a live connection with the surrounding pericementum, which is composed of bundles of fibrous tissue, surrounding the root of the tooth, and containing blood-vessels and nerves. We necessarily come to the conclusion that even an apparently dead tooth, that is, a tooth deprived of its pulp, must to a certain extent be supplied with nourishing material and be alive, at least in the peripheral portions of the cementum. How far that life goes nobody can say, for it is impossible to determine under the microscope the difference between living matter that is still alive and living matter that has become dead. The

fibres are preserved, and so is the reticulum, and we may infer that there is a degree of vitality left in the cementum even after the destruction of the pulp.

I now come to the only soft tissue that enters into the construction of a tooth, the pulp tissue. This was also the subject of very careful researches in my laboratory by Dr. Bodecker. It was known that it consists of a delicate myxomatous tissue, which at the points of intersection shows thickenings called nuclei, evidently the centres of nutrition, or rather centres of life. There is a reticulum in the shape of delicate fibrillæ, between which lies the basis substance that we call myxomatous. Both the fibres and the myxomatous basis-substance are the seat of life, being pervaded by living matter. The pulp is one of the few myxomatous tissues in the human body that remain myxomatous in the adult. While in the embryo there is present a great deal of myxomatous tissue, nay, originally every variety of connective tissue is myxomatous in nature, about the time of birth we have only the umbilical cord, the placenta, the vitreous body of the eye, and the pulp tissue. The tissue of the pulp remains myxomatous during life. We know that as soon as the pulp assumes the features of fibrous connective tissue we must consider this condition as morbid. A pulp that has once been the seat of inflammation will become hyperplastic and cicatricial or fibrous. The myxomatous tissue of the pulp is pervaded by a large number of nerves. They run in bundles in the shape of medullated nerves, which, as they approach the periphery, become non-medullated and send numerous off-shoots toward the periphery of the pulp tissue, where the dentine is located. Here we find bodies in rows, having the aspect of epithelia, called odontoblasts, which are invariably present whenever the tooth is fully developed and is in a condition of comparative rest. I lay stress upon this fact, for it seems, as shown by an article that I received a few moments ago upon the development of the enamel, that it is very difficult for some histologists to understand that a tissue once formed is not

permanent, and does not retain a permanent form during life-time. What I said about the tissues changing their shape and place during life in general, holds good with respect to the single elements. We have been told that after the so-called cell has formed it could not change farther. But, on the contrary, I am convinced that such changes occur through the life-time of the person, and invariably takes place during the growth of the tissues. I am convinced that these odontoblasts are formations to be found only at comparative rest, when there is no change going on toward a new formation or growth. As soon as such growth is going on, we see the odontoblasts no longer in the shape of epithelial bodies; they are transformed into medullary or embryonal corpuscles. We can prove that changes in the pulp tissue for the transformation of one tissue into another, namely, into dentine, can take place only through the intermediate stage of embryonal tissue and embryonal corpuscles.

Gentlemen, those of you who have not looked at the specimens in my laboratory probably will not have much faith in my assertions, especially in view of the fact that they are by no means universally accepted yet. I did my best last year in Europe to bring these views to the notice of the majority of the scientists in Berlin, Vienna and Heidelberg, but it was only in Vienna that they met a hearty approval, and this was owing to the fact that in Vienna resides the most advanced histologist of Europe, Professor Stricker. Neither in Berlin nor in Heidelberg were they advanced far enough to appreciate the value of these researches. In Heidelberg I spoke before an assembly of ophthalmologists and gave an exposition of the structure of the vitreous body which fills the posterior chamber of the eye, and the crystalline lens. I laid before them the proofs that the crystalline lens as well as the vitreous body, the former being epithelial and the latter myxomatous tissue, are alive. The prevailing idea there was that the vitreous body is a jelly-like mass, the same as

in previous years. The idea prevailed that the umbilical cord was nothing but jelly, whereas I can demonstrate the presence of living matter through that jelly. I maintain that the vitreous body is a live tissue, and so is the crystalline lens. I assert that the lens undergoes changes, its epithelial structure, under certain conditions breaks down into medullary tissue and gives rise to new tissues, to connective tissue and even to bone. Two or three observers have agreed with me, but the great majority have not. I say that frankly because, although it is the aim of my life to show the correctness of these views, I am fully prepared to wait at least ten years yet for their acceptance. Professor Stricker, in a criticism on the German edition of my book, expresses his opinion that in the next ten years these, my views, will replace the old cell-doctrine. Perhaps it will take much longer. Perhaps I shall not be living when they are accepted. But one thing I can say, which is that so long as I live I propose to work and fight for their acceptance. When I returned from Europe last year, a friend said to me, "I traced your work through Europe; you have fought as hard as Sampson against the Philistines." I replied that the result was not fully satisfactory, perhaps because I did not work with the jaw-bone of an ass, as did old Sampson.

This little diversion from my subject was merely intended to demonstrate that transformations and transitions of tissues and elements are going on throughout life-time. Here you see (drawing on black-board) the odontoblasts at the periphery of the pulp tissue. It has been asserted by Tomes that the dentinal fibrillæ arise from the odontoblasts, being their direct off-shoots. This is correct so long as the odontoblasts resemble epithelia; but as soon as there is a transformation of them into medullary or embryonal corpuscles, there arises a number of delicate fibrillæ between the former odontoblasts. In many instances where the odontoblasts were fully developed, the fibrillæ were traced from their periphery, but when the odontoblasts have

changed into medullary elements, we can see the fibrillæ which we call dentinal fibrillæ, run between the odontoblasts, and either directly or indirectly through the reticulum of living matter in connection with nerve fibres. It has been maintained that this transition is a direct one, but this seems not to be the case, at least with majority of the pulps I have seen. The question is of no importance, however, because both the fibrillæ and the nerves are fermentations of living matter. To-day it appears that it was no mistake of Tomes to maintain that the dentinal fibrillæ are nerves, for even to-day we know no boundary line or sharp distinction between the fibres of living matter, termed dentinal fibrillæ, and those termed nerves. There is a continuity of living matter from the periphery of the enamel of a tooth through the dentine with the nerves of the pulp, and, of course, with the brain and the sensual organs.

These are facts, at least acknowledged in my laboratory, and I hope by all of you who have attended my lectures. And now the question arises, what is all that good for? to be sure, the scientist does not care much about the usefulness of any discovery he makes. He takes the facts as he finds them, and very rarely thinks of the practical value that may arise from them. Nevertheless, I dare say that the practical value of the facts laid down before you is very great indeed. I believe every one of you will understand that it makes a great deal of difference in the practice of your profession, whether one takes it for granted that a tooth is merely a piece of chalk, an accumulation of lime salts, or whether one regards it as a live tissue. Even the enamel, which was formerly considered as being something like a very refined calcareous or crystalline material, we have proved to be a live tissue. It seems to me that every dentist must recognize the importance of this discovery. In former years to remove at random a certain amount of the enamel, to trim it off in order to increase the space between the teeth and thereby facilitate access to a carious cavity, was considered as but a trifling matter, and perfectly

legitimate. To-day the cutting of the enamel must be restricted to a great extent. As soon as we know that the enamel is alive, and the best protective tissue of the teeth, we must become extremely careful in handling that tissue. We can no longer remove the enamel simply to increase the space between the teeth; we should rather remove a superfluous tooth and let nature repair the injury, than remove the enamel. Certainly we will not remove the enamel in order to gain easy access to a carious cavity unless it is absolutely necessary.

A second practical gain is the knowledge that every foreign body we introduce into the tissues of the teeth will have its future action and re-action upon them. Every filling that the dentist brings into a tooth is a foreign body, and as such necessarily excites more or less inflammation. A hundred years ago the celebrated German philosopher and poet, Goethe, made some examinations of the tusks of elephants, which were the seat of gun balls. We know that the target of the elephant hunter is the socket of the eye. That being missed the ball not infrequently enters the animal's tusk: and it was found that a gun ball lodged in an elephant's tusk, and remaining there for months or years, produces a remarkable change in the dentine. This is easily recognized by the naked eye of the manufacturer of billiard balls from these tusks. The dentine of a tusk in which a gun ball has been lodged presents a changed appearance; it has become brittle and unfit for to be turned into billiard balls because it has lost its elasticity. Here is a proof that a foreign body produces quite a marked change in the dentine. A filling that you introduce into the enamel or the dentine for a beneficial purpose will work exactly on the same plan; it is a foreign body, and, therefore, will excite reaction and an inflammatory process, the result of which will be a change of the tissue. This may, I admit, be beneficial in the highest degree. Suppose the inflammation around a filling leads to changes which render the dentine more firm and solid; that I would consider an excellent

result of the filling. But suppose, on the contrary, that the reaction caused by the filling should be so intense as to excite a severe inflammation around it. The whole tissue being built up of living matter, the consequence would be that the inflammation would spread toward the pulp chamber, the pain, in many cases, becoming so great as to demand the removal of the filling, even though it be at a considerable distance from the pulp chamber. Evidently it is of importance to know how much living matter is present in any given case; in other words, how much of the material of the teeth is lime salts and how much live tissue. We know that the temporary teeth have very large canaliculi and very extensive formations of living matter, with a small proportion of lime salts, in comparison with the teeth of adults. We must, therefore, take into consideration this state of things whenever we put a filling into a temporary tooth. Although I am not a dentist, I should say, speaking from a theoretical standpoint, that I would not consider it good practice to put a gold filling in a temporary tooth, the probability being that a solid gold filling will produce too great a re-action and inflammation will arise. In the teeth of adults you find a much greater degree of hardness and consistency, which is readily discovered when you work upon them with instruments; and the teeth of adults again differ in hardness. Therefore, from a theoretical standpoint, I should urge upon dentists to be cautious and not confine themselves to one filling material, such as gold alone, but to have on hand different materials adapted to the needs of different individuals and the requirements of different kinds of teeth.

It has been maintained that civilization and culture have a great deal to do with developing the process of caries in teeth. Such was the assertion of an excellent New York dentist, Dr. Kingsley. Now, if we say that the more culture advances the more prone are the teeth to become carious, I think we have not exhausted the question, and have not reached the bottom. We know that with advancing culture bodily strength usually decreases. We know that strong, iron constitutions are found in people who fight all their life-times against the

influences of the weather and climate, people who work hard and do not over-feed themselves whereas people who have highly cultivated their minds, and at the same time neglected to exercise their bodies as they ought to, frequently do show a noticeable decay from generation to generation. That is a point settled in the last century by J. J. Rousseau and other encyclopædists. If among highly cultured people caries of the teeth is a prevailing feature, we must come to the conclusion that the organism is lacking in lime salts, and the process of caries thereby fostered. Caries has been proved to be an inflammatory process, which is assisted by low vegetable organisms, leptothrix and baccilli; and very probably such a morbid process is more easily and rapidly progressing in teeth poorly supplied with lime salts than those of strong and healthy people.

Lastly, the value of these new views will be apparent as soon as we study the history of the development of the teeth. According to the cell doctrine previously held, the tissues of the body being once formed cannot change; but with such views the development of the teeth was not explicable. To-day we are able to understand that an already formed tissue may change, return to its embryonal condition and give rise to new tissues; and we must realize that the growth of tissues can take place only through an intervening stage of medullary tissue.

I have laid down these novel principles in my microscopical morphology, and there for the first time brought them before the public. Both English and German editions of the book have been issued. I thought that publication would help to make the new views more popular; but after a time I came to the conclusion that outside of the laboratory, and direct demonstration of the facts, there is little hope of spreading the new ideas. Even comparatively good histologists outside of the laboratory, who are not pains-taking enough to investigate the matter, especially in the way in which I teach it by educating the eye to see and requiring the hand to draw everything upon paper that is seen, hardly ever will become convinced of the correctness of these views. A histologist in New York went so far as to decline the honor that America has in accept-

ing this new doctrine. My laboratory has been a great success. I have just finished the eightieth class, and that means at least 800 attendants in a little less than ten years. I think that proves at least one thing, namely, that American histologists are ahead of those of other nations, that they can see more and be taught easier. The gentleman I referred to thinks America needs no such distinction, and does not even consider the new doctrine a progressive step.

I bring these facts before you, gentlemen, in order to frankly show you the difficulty of teaching new truths. Every one who is anxious to learn anything about a novel doctrine have a teacher in the first place. I had my teacher, and I am the teacher of others who will, in their turn, be the teachers of others still. It is, therefore, with the view of asking those of you who are interested in these things, and desire to learn how to demonstrate them, to come to my laboratory. Quite a number of the gentlemen here present have been there, and I dare say that none of them have left it dissatisfied. I did not bring a microscope here, nor anything in the way of demonstrating these facts, for I know it is futile to attempt to do it at once. The eye must first be educated to a certain extent, and when you are prepared to see you can see what there is to be seen. One of the most important things in connection with dentistry is the use of the microscope. I believe that as the knowledge of these new views broadens the mind, and more attention is given to the study of microscopy, you shall look upon the teeth in an entirely different light from what you did before—
Proceedings of New Jersey State Dental Society.

ARTICLE II.

ARE MICRO-ORGANISMS NECESSARY TO PUS FORMATION.

BY G. V. BLACK, M. D., D. D. S.

The thought of pathologists has been that the formation of pus is a vital act of the tissues and follows severe

inflammation, or occurs in the healing of wounds, as one of the train of normal events. The idea that this process does not belong to the vital phenomena displayed by the tissues, has entered the minds of very few, perhaps; and with the observations of the past in which this event has so regularly followed in wounds or resulted from inflammations, it seems almost incredible that the time-honored opinion, one that has been accepted as a truism in all past ages, and down to the present, should now be questioned.

But very recently (*New York Medical Record*, December 25th, 1886), Dr. Knapp, an oculist of New York, has published views that are very significant, if not startling, on this subject, and he has summed up strict experimental evidence going far toward the establishment of the view that pus is not produced except in the presence of bacteria, and through their agency, that can no longer be ignored by pathologists.

There is no class of medical men to whom these matters come more closely in their daily practice than to dentists. We should certainly be abreast of the world in knowledge of these matters. Indeed we have to do directly with pus formation, and must take measures for its hindrance, or for its eradication, in every case in which we open the canals of a tooth's root; which, with those of us who are in full practice, is a thing of daily occurrence. This fact alone is sufficient to show that too much stress can not be laid upon gaining a correct understanding of this subject.

Dr. Knapp sums up the evidences that suppuration occurs only in the presence of micro-organisms under three questions:

"1st. Does traumatism of any kind produce suppuration?"

"2nd. Do foreign bodies occasion the formation of pus?"

"3rd. Are there any kinds of chemical agents that cause suppuration?"

On the first of these is cited the well known fact that subdermal fractures of the bones heal without suppuration. This fact is too well known to require any elaboration. But there are occasional exceptions to the rule, and these require some notice. The attention of clinicians has been strongly directed to this, and the search for the cause of this unusual suppuration has been vigorously followed. In this search it seems to have been pretty thoroughly established that in such cases there has been an established focus of suppuration in some other part of the body. And the suggestion that in such cases the pyogenic fungi have been transferred to the point of fracture from the abscess through the medium of the blood, has given rise to severe experimental tests with the view of ascertaining whether or not this is possible. Becker and Krause fractured the limbs of healthy animals and observed that they healed regularly without suppuration. They repeated these experiments in the same way, except that they injected pyogenic fungi into a vein of the ear (in rabbits) and found that in these cases the fractured limbs as regularly suppurred, and the same order of fungi as that injected was found in the pus, thus furnishing direct proof that pyogenic fungi may be conveyed to other parts by way of the circulation; and, while not necessarily producing injury at the point of inoculation, may produce suppuration in localities where *inflammatory exudates* give them a favorable nidus for development. This result has occurred with such regularity in these experiments that it is assumed by the experimenters that, in case suppuration occurs in subdermal fractures, this is a sufficient proof that a focus of suppuration exists somewhere in the body, whether such focus be found or not.

In addition to this testimony Dr. Knapp relates his own experiments in which he has lacerated, bruised, cut, and burned the eyes of rabbits in the most hideous way, aseptically, and uniformly without the production of pus; while comparatively delicate operations contaminated with pyogenic fungi as regularly suppurred. In many of his

trials Dr. Knapp operated in the same way on each eye of the rabbit, one aseptically, the other contaminated with pyogenic fungi. The aseptic wound regularly healed by first intention, the septic as regularly suppurred. These operations were reported at length in the *Archives of Ophthalmology* last summer and the *New York Medical Record*, December 25th, 1886. As a criticism upon these two series of experiments taken altogether I would remark that it seems somewhat strange that fungi should not occasionally produce suppuration in the eye operated upon aseptically, having found their way thereto through the blood-streams, as in the experiments upon fractures.

The second question we do not need to discuss. I think it is fairly established that a foreign body does not, *per se*, produce suppuration. A bullet may lie in the flesh for years, shift its position by gravitation, etc., yet not cause the formation of pus. Other observations also go to establish the fact that foreign bodies do not of themselves produce suppuration. I may, however, mention the fact that Dr. Knapp thrust broken pieces of rusty hair-pins, previously brought to a glow, but not otherwise cleaned, into the eyes of rabbits and found that they did not cause suppuration. These were introduced with antiseptic precautions.

The third question is the most difficult of all, and the one upon which the greatest stress has been laid. Certainly if suppuration can not be produced by chemical irritants, the question of the production of pus by any form of injury *per se* must be given up, and the cause of this act must be sought without the tissues themselves. That is to say, the life forces resident within the tissues have not within the range of their unaided vital processes the power of the act of pus formation. This is the rather startling position to which we will be driven. I think such a proposition will be received by pathologists with great hesitation.

The proof of this proposition, as far as it is as yet developed, rests mainly upon the testimony of the experiments

of five persons. These are J. Straus, E. Scheuerlen, Geo. Klemperer, J. A. Ruys and Dr. Knapp, all of whom seem to have performed their experiments in such a manner as to thoroughly test the possibilities in a practical way. I will not analyze all of the experiments but will simply indicate the plans of experimentation, and give the general results.

J. Straus used a sterilized tube tapering to a sealed point at one end, and closed with a sterilized plug at the other, containing a sterilized irritant. The skin of the animal was sterilized with the actual cautery, stabbed with a sterilized knife, the thin end of the tube introduced, broken within the tissues, and a few drops of croton oil, or other irritant, blown out into the tissues, the tube withdrawn, and the wound sealed with the actual cautery. Of eighteen injections of turpentine, five suppurated. Of five injections of croton oil, one suppurated. Of two injections of mercury, none suppurated. All of the cases of suppuration showed cocci in the pus, and were therefore considered as failures in obtaining perfect asepsis.

Scheuerlen's plans were better. Thin sterilized sealed tubes containing the sterilized irritant were placed under the skin with antiseptic precautions, and were allowed to remain ten days, or until the wound, through which they were introduced, had perfectly healed, and then they were broken, setting the irritant free in the tissues. A large number of experiments seem to have been made, using about a dozen irritants, among which were turpentine and croton oil. After breaking the tubes a hard swelling occurred at the spot, but no suppuration except in one case. In this one the experimenter concludes that the wound had not perfectly healed, and that cocci were in its track. Cocci were found in the pus.

Klemperer's experiments were made after the plans of Straus, and gave very similar results.

Drs. Ruys and Knapp injected croton oil and turpentine into the anterior chamber of the eyes of rabbits with

antiseptic precautions. Here the effects could be seen, whitish deposits occurred which passed away after a time, but no suppuration in the larger number of cases, and in those in which pus was formed cocci were found also, showing that these had not been excluded.

The effect of these experiments certainly tends strongly to establish the proposition that without micro-organisms there is no such thing as pus formation. Farther than this the universal testimony of observers is that pus formation is confined mostly, if not entirely, to a specific form or family of micrococci, of which there are a number of species well known to mycologists. If I have read the results of experimentation aright, and observed aright (for I have also cultivated, and to a limited extent, experimented with these fungi,) this species of fungi is incapable of attacking normal living tissues. In case of subdermal fracture of a bone they produce suppuration at the point of fracture if injected into the veins of the ear, but do not produce suppuration at other points of the body. A focus of inflammation seems to create their opportunity. Many other organisms may attack living tissue without the aid of an inflammatory focus, but not these.

With these facts in view Dr. Knapp asks these questions and gives these answers. "What is pus? An albuminous non-coagulable fluid containing multitudes of leucocytes. What is suppuration? The splitting of living nitrogenous tissue into simpler compounds through the influence of certain bacteria." "In this way," says he, "the parallelism of the three processes—fermentation, putrefaction and suppuration—is established."

Now while the facts seem to drive us to some such conclusion as is intended to be formulated here, the formulation certainly can not remain as it is. I have no quarrel with the separation of fermentation and putrefaction, if it be understood that the distinction is simply between the nitrogenous and non-nitrogenous forms of one process which is in every case performed by some variety of fungi—bacteria,

cocci, or bacilli. These facts need no demonstration now. But how can we conclude that pus formation is a variety of these processes? Certainly not through the idea of the disruption of the elements of living tissue. We have been taught that pus production consists of a certain form of albuminous exudate in which amœboid cells are found dead, and furthermore that many of the amœboid cells that come to the front in the healing of wounds die and float away in the purulent fluid, while a large proportion become built into a wall of living tissue, and as this is perfected the formation of pus is diminished. While there is a constant loss of living cells, the cells prevail in the end in all of the ordinary suppurations. I should therefore formulate the statement thus: *Suppuration results from the fermentative disruption of inflammatory exudates through the biological processes (or through the growth) of certain forms of cocci known as pyogenic fungi.* Or, as the cause of fermentation is so well understood in these days, the formulate might be limited thus: Pus formation is the result of a specific fermentation of inflammatory exudates. The word putrefaction might be substituted for fermentation as the material contains nitrogen, but from the fact that ill smelling products, characteristic of what we regard as putrefactive changes, are not present in the first instance. From my own observation I should conclude that the production of ill smelling products in pus is in every case due to a second process of disruption (this may go on contemporaneously), and by other germs than those that originally produce pus.

By the word inflammatory exudate here I intend to exclude the amœboid cells though recognizing them as being included in the exudate. No other part of the exudate can be regarded as living matter. The plastic portion is formed material that lies close to the very domain of life, but is not itself living. It is the proper matrix of the amœboid cells, which develop and go on to the formation of tissue within it. It disappears as the cells develop and form the living tissue, that finally closes the wound that has at

first been sealed together by the plastic exudate. Now if this latter is disrupted, and rendered fluid, by a fermentative act, *i. e.*, a growth of pyogenic fungi, the amœboid cells die and become pus corpuscles. In this way we come to a formulation of the steps of the process of pus formulation that is at once rational, in harmony with the new facts obtained, and in accord with all of the teachings of science thus far developed, and yet without change in any of the material facts hitherto developed, except in the one idea that the formation of pus is a vital act of the tissues. According to this view, the production of pus is not a vital act of the tissue from whence it emanates, but an act of pyogenic fungi which take advantage of a definite form of opportunity.—*The Dental Review.*

ARTICLE III.

COURTESY AMONG DENTISTS AT PROFESSIONAL MEETINGS.

BY J. N. FARRAR, M. D., D. D. S., NEW YORK CITY.

[An annual oration delivered before the American Academy of Dental Science, Boston, Mass., November 10th, 1886.]

Mr. President and Gentlemen :

It is with misgivings that I attempt to speak upon a subject from which people shrink, because I do not feel able to put it as forcibly as it deserves. But I esteem it a duty to ally myself with others in the battle against error, and in the support of principles necessary to the advancement of the profession, notwithstanding it may be unpleasant.

I trust that my remarks will not be taken in any other than a kindly spirit, as they are intended only for general good, through the influence of my hearers, wherever they may go. I say this because I do not wish it thought that

references are made to this society, concerning which I have never heard aught but good.

Although I may offer nothing new, I hope, by pointing out some practices, to place the matter in such a light that the motives behind them may be recognized whenever present, with the view of correcting evils that would make the profession blush with shame if they were publicly set forth by some prominent writer of fiction. I refer to the objectionable methods that have been too frequently practiced tending to hurt personal feelings, or injure personal standing. It is not my intention to dwell upon the science as a science, or as regards professional courtesy in and through business, or the damaging and paralyzing influence of political "wire pulling" at elections, but my remarks will have reference more especially to graver conduct; the crippling and assassination of genius, which has been practiced for years in the meetings of societies: not that other professions are exempt from this blight, but that ours is the one with which we have principally to deal.

Sometimes this is conducted in an open, warlike manner, at others more in the style of intrigue, under the guise of "love for truth;" not within the limit prescribed by the spirit of Mosaic doctrine, "a tooth for a tooth," but too often in the spirit borne by the hawk toward the innocent dove; unlike the good teacher, who seeks to draw out the latent power of the listener's judgment by kindly criticism upon the subject, the critic too often indirectly aims his shafts at the speaker personally, with intent to injure his popularity.

It may be thought that the only improvement dental societies need in their meetings is to talk less and say more; but, however true the saying,

"They never taste who always drink,
They always talk who never think,"

it is not enough for the cure of this evil.

The influence of courtesy is wider and reaches deeper into business, as well as social life, than is commonly sup-

posed. He who recognizes favor merely on one side of a business transaction, fails to understand, not only what constitutes honor, but the commonest principles underlying society. A merchant who does not know that his profits come through a form of courtesy of the purchaser, cannot understand why he should show courtesy to an honest man who has been prompt pay for years, by not crowding him in the time of distress. One who says, "I gave him his money's worth, therefore he has no claims upon me," should not feel hard toward an old customer if he should leave him and patronize another who has more humanity in his nature. Just so is it in professional life. He who shows no courtesy by making distinction between the conditions of patients, and who plays "the spider and the fly," and, taking advantage of their confidence, presents exorbitant bills out of all proportion to the value of service rendered, ought not to be surprised if, in the days of his gray hairs, he finds himself in want of funds, friends and business. So he who has no higher aim in discussion on scientific subjects than personal aggrandizement at the expense of others, not only is a "millstone that clogs the wheels of progress," but he grinds himself out of recognizance.

Unlike the people who lived in the days of Homer, when dark ignorance was the rule, most people are now able to detect the motive. While in olden times the masses, attracted by a few brilliant intellects, like meteoric lights, were led by them, the difference between the leaders and the led is not now so great. Instead of one or two bright stars here and there, there are now so many that this world seems more like a torchlight procession marching in grand array. A few tyrants still exist; but their thrones are dissolving away by the light of truth thrown upon them through the efforts of sincere and modest scientists, the class most loyal to the interests of the profession, and who would often do more if encouraged.

Born and reared not far from this city, in a town where public debates were common and were conducted by rules

of strict courtesy ; where it appeared to be the fashion and desire to try to outdo one another in politeness, and to take no notice of those who dared show ill-feeling ; where there seemed to be an understood though unwritten law that, to speak unkindly of others, whether in their presence or during their absence, was to dig one's own grave—was it strange that I should have been amazed when I went forth into the world and saw these principles violated so frequently as to cause such fear in the more timid minds, that they prefer to remain silent rather than to place themselves in the current of personal abuse of those who seem to feel that the strength of their citadel depends upon destroying that of others ? Of course, since people differ in their dispositions, allowance should be made ; but for the violation of the commonest rules of courtesy, there can be no reasonable excuse.

There are those who are gentlemen under all circumstances, wherever found ; who do not think that, because others may conduct themselves improperly, it is a reason why they should ; there are those who appear like gentlemen toward everybody in society at large, who carry none of it into meetings to show toward their brethren in discussion ;—everything nice to the outer world, and even toward members of the profession individually met, but who forget that it is equally good policy, if for no higher reason, to show the same disposition in society meetings.

There are those who quarrel for the love of it, and who like to meet their equals, and there are those who delight in finding a timid person to climb upon, no matter how talented he may be. Such pugilistic spirits do not always appear to know when they are defeated in argument. They love debate, but cannot set themselves a-going without first throwing a club ; like the boy who slings a stone at a cow to create an impression in his favor, and then rushes on.

Those who delight in this appearance of altitude, and think it necessary to first silence those who presume to speak upon subjects on which they have thought themselves

authority, are often paradoxical in their nature. I once knew a person of this kind, who, after shamefully abusing an essayist by belittling him, subsequently found his equal in the essayist, and being severely punished, in a second speech made eloquent remarks upon the foolishness of indulging in personalities in scientific meetings.

If they who fight openly are reprehensible, what shall we say of those who seek to destroy in a more stealthy manner; who, under cover of suavity and apparent politeness, carry the insinuating dagger?

Some work simply to destroy, without disposition to rebuild; others seek first to lower the structure of the opponent to a level with the ground, and then to rebuild for themselves. But to build a superior structure alongside that of another, so that the difference can be seen, is proof of superior ability, much more persuasive in its influence, and its fairness commands the respect of everybody, even of those who are not convinced. There is no such powerful means of progression towards personal elevation, as through a spirit of generosity and courtesy, shown in respect for the opinions of others. He who to himself would have courtesy shown, should first himself show it to others.

Courtesy is of two kinds; natural, and artificial. When courtesy is the expression of generous refinement, it may be said to be the perfection of gracefulness. But courtesy artificially attained is better than swinishness, for the same reason that deformity is less objectionable hidden than if exposed. Exposed mental deformity is even more objectionable than exposed physical deformity.

It does not follow that to express one's adverse views with effect, it must be done in a pugilistic manner. Politeness is a bond of good fellowship, and begets friends; while selfishness embitters the social atmosphere, and freezes the tender impulses. There is no spectacle so grand and noble as two opposing debaters facing each other as gentlemen, vying in politeness as if endeavoring to out do each other in courtesy, though not descending to flattery. Adverse

criticism, even if a little harsh, is more acceptable to a sensible opponent than treacle. I have known great undertakings, and elaborate preparation for scientific discussion made total failure by a few garrulous, quarrelsome, omnipresent spirits who consumed the time on unimportant things, such as parliamentary trifles, consuming time that might have been used to far greater advantage in the scientific discussion for which the meeting was called, causing disturbance of mental equipoise, as shown in loss of interest and bitterness of feeling.

Understand me, I do not advocate ignorance of parliamentary rules, but to make the scientific object of the occasion subordinate to trifling and unimportant technicalities is not conducive to the growth of scientific knowledge, nor is it satisfactory to the majority of the members.

Some might say, to guard against this drawback more of the better quality of material is necessary. That, to strike at the root of this evil, greater discrimination must be used in the selection of pupils to the profession, which implies more natural refinement and higher scholarship; a quality of men who would set their heel upon such conduct. Undoubtedly could the Utopian view be carried out, it would go far to remedy the evil; but our present object is to doctor ourselves, and then, having healthier and better blood, to try to infuse it into others.

Probably there is no better way of preventing this descent to personalities, than by the exercise of determination by the President; and I doubt if there is a society in this broad land that would not, as a whole, stand by him when he exercises it. Bullies may poor soldiers, and cower before legal power.

Conducted in accordance with these principles, a society will grow, socially and scientifically; but, in the proportion that the meetings fall below this standard, in that ratio will the righteous indignation of popular opinion sooner or later express its disapproval to such an extent that genius will absent itself, and the society crumble into decay through apathy.

There are other methods of committing this crime, as by boycotting the speaker by remaining away from the meeting, or being present with the sole view to destroy him through his subject by drawing his thoughts away from his theme ; asking questions not relevant. Boycotting, however, is so obnoxious to the American that little need be said further than that this spirit, though not so rife as in former years, is not entirely extinct.

Probably the most cowardly way of all is the indulging in slurring personalities in public meetings against an absent party, who cannot defend himself. One of the most peculiar ways of making an attack upon an absent person, whose name cannot relevantly be dragged into the discussion of the meeting, is to have an understanding with some member of the society to call upon the enemy to express his views upon the subject in which the absent party is especially interested.

To assume superior wisdom and to endeavor to overawe these pretenders, presuming upon the ignorance of the audience sometimes to make bold statements on abstruse and uncommon phases of subjects, assertions, the truth or falsity of which would require a year of hard experimental study to determine, this is a trick that I have known to be practiced more than once with wonderful success. Sometimes, however, a David rises up, and, with the fruits of patient toil, calmly slays the misleading hypotheses of such would-be Goliaths.

Having confined my previous remarks to the conduct of person to person, we now may come to the acts of members taken collectively, which the following incident may illustrate. In speaking with a prominent member of our profession regarding a certain measure endorsed by his society, he was asked how they could commit so unjust an act. His reply was this: "Probably there was not a member present at that meeting, who, if he had acted from his own heart, would have voted for the measure; but you know that sometimes men collectively dare to do things that individually they would be ashamed of."

To criticise the views of an essayist in an offensive manner, casting aspersions upon his mental ability, under cover of the pretense that the society will be held responsible for the influence his views may have upon the profession at large, if made public through the press, is probably one of the weakest excuses for displaying prejudice. The public generally gives credit to people for what they are worth, and does not place much stress upon the whereabouts of the speech. If erroneous views are set forth in societies that publish their proceedings, would it not be as well to leave that matter to the discretion of the editor and his basket, rather than to make rancorous speeches that injure the reputation of the society more than the essayist? It is bad enough to fight on one's own account, but for a member to place a society in the light of Balaam's friend, to ride to battle on, is not conducive to the growth or the popularity of the society, or to the advancement of the profession.

Not long ago a member of high standing, a man who is in every respect a gentleman, one whom you all know, after having read a very scholarly paper, was attacked in a bigoted manner on a point not at all relevant to the subject, and, in the "star-chamber method," was ill-treated in a manner not at all creditable to any society. This essayist afterwards said to me that he was always very glad to be the object of honest, intelligent criticism; but when criticism comes in such a shape to an invited guest he could not forget it, nor would he stoop to strike back in a spirit of wrath. This is not an exceptional case. I have known many such, and have lived long enough to see decay set into every society that tolerated it.

When a man is invited to speak before a society, he naturally expects to be treated in a gentlemanly manner, even though his ideas may be at variance with those of some or even all, of its members. The value of such occasions often depends upon the remarks subsequently made by others in reply to the speaker; but courtesy demands that respect should be shown, not only in the criticisms, but also

by absence of low grumblings, loud whisperings, or any other means of making a noise with intention to disturb the speaker, or to attract from him the attention of the audience. Silence and close attention are absolutely necessary to secure the best efforts of some speakers, especially if they know that, among the audience, there are those who do not sympathize with him. There speaks in New York, every Sunday, one of the most eloquent orators of the nineteenth century, who is so easily thrown from his equi-pose that he requires the outer door to be locked when he commences, that he may not be disturbed by stragglers.

Criticism is the life of a scientific meeting; but if I may be allowed to quote from myself:

Virtues, by proper use,
May become vices by abuse.

Personal abuse is not criticism, nor is faultfinding criticism; but to differ from one's ideas upon the subject and to show why, when done in a kindly and candid manner, is agreeable to an audience, and not objectionable to any right-minded speaker. By right-minded I mean more than having knowledge of the fact that an excessive flatterer is a mercenary person, and one who cannot be relied upon in times of adversity, nor when character is wantonly attacked behind the back, but one whose love for truth and desire for the advancement of knowledge is closer at heart than some pet hypothesis or personal aggrandizement. The former comes from a spirit of generosity; the latter, jealousy. One is the open helping hand; the other, a clenched fist, disputing the right to step on ground it considers its own.

Brotherly love, shown in the courteous examination of a subject, stimulates freedom of intercourse, cultivates humanity of feeling and keeps down the pugnacious element. A method that builds up the truth with evidence, so that it stands above all surrounding error, instead of the old feudal method of attaining superiority through the destruction of others. Compeers make compeers by kindly feelings, through mutual support, while abuse kills the growth of

the abuser by isolation, as much as if he were upon an uninhabited island, unknown, living to no purpose superior to that of the vegetable. No man can become great of himself alone, and without the sympathy of his fellows.

Admitting that all have their friends, and everybody of any account his enemies, and that to be a gentleman under all circumstances is the privilege of all, let us with a spirit of gentleness toward our brethren of different opinions, our actions showing that the expression of different views stimulates thought and a disposition to learn, let us, shoulder to shoulder, move on with solid front, with higher aims to higher ground, that we may command the world's greater respect.—*Independent Practitioner*.

ARTICLE IV.

TRANSPLANTATION OF TEETH.

BY WM. N. MORRISON, D. D. S., ST. LOUIS, MO.

[Read in the Section on Dental and Oral Surgery at the Thirty-seventh Annual Meeting of the American Medical Association.]

I will give the history of one very interesting case. In the *Missouri Dental Journal*, of July 15, 1882, is a paper by me upon this subject, and among other cases reported is a prospective case which presented itself last fall: A young lady of slight build, about 22 years of age, teeth not of extra quality, arch perfect, and articulation correct, except the left-erratum; read right- instead of left-side of the mouth; superior canine, which was missing. The left-central was very loose. On careful examination I found it to be caused by the absorption of the root below the cervical line, by the crown of the canine, which lay horizontally in the process with its point to the median line, entirely across the root of the central, the latter being as thoroughly absorbed as though it was a deciduous tooth.

I had decided to extract both and transplant the canine to the socket of the central, after enlarging and deepening it to correspond to the root of the canine; after the canine had become fixed, if the crown could not be made to look as well as a central, I intended to cut it off and substitute a porcelain crown with a metallic pivot; but this heroic operation was indefinitely postponed by reason of the young lady being called home from our city.

This case is all the more wonderful from the fact that six dentists had already identified themselves with it; two of a neighboring city told her it had been broken off by a blow or a fall. Although previous to that decision one had constructed and adjusted regulating plates which were worn for months; exostosis being assigned as reason for enlargement; but a tooth never until I demonstrated it. Such was the case up to the time I first saw it, and gave my diagnosis and plan of operation. Other members of the patient's family had their favorite dentists, and she was taken to one and my plan duly explained and criticised; it was pronounced an impossible, impracticable and dangerous thing, but my diagnosis was pronounced correct so far as the canine was concerned, and its extraction was urged; to make this decision more forcible another was called in consultation, and they administered ether, and gouged away the process, exhausting themselves and the patient after breaking off a piece of the crown.

Further operations were postponed till some days later, when Dr. ———, who was called to use his persuasive powers and hold her hands, renewed hostilities, but with no better success. About three weeks later she was taken by the above or by their order to Dr. ———, who administered gas and extracted the canine, which was laid away to dry, and the patient assured that the central would grow firm again and be as useful as ever. When the root was entirely absorbed and the crown only suspended by slight attachment to the gum, the patient returned to her home, carrying with her the extracted canine trophy. All this occurred in

the fall of 1881, and I had no knowledge of it until the discussion of my paper in the St. Louis Dental Society.

Now two years later, or three years after I first saw the case, the patient came to see if I would not transplant her right lower canine in the place of the upper central. The canine was condemned to extraction by another dentist, as its occlusion against the superior lateral was forcing the lateral out of place and making it assume an unsightly angle to the others. The central was hanging loosely to the gum and had been for three years, the other teeth supporting it laterally, and the lip and tongue antero-posteriorly; the patient was in constant dread of swallowing it, particularly at night. Contrary to the opinion of my brother dentists in the society, and statistical evidence collected from best dentists all over the country, (see discussion of the paper, *Missouri Dental Journal*, page 247, July 15th, 1882), the operation was performed; the loose tooth was removed and with a drill, (using cocaine). The process was opened up exactly in the track of the root which should have been there; at any rate I expected to find a piece of the root, but not a particle was there; with drill and fissure bur I enlarged and deepened the socket quite to the floor of the nose, and antero-posteriorly from plate to plate; and remember the anterior plate was cicatricial bone and not any to spare at that, owing to former extractions of canine, above described; the teeth and general shape of the socket being now known. The right lower canine was extracted, and root vessels removed, and canal filled with gold wire, and a prominent contour filling built upon its distal face or long angle, with platinum gold, which made the median edge of the new right central which it was to be. The root was long, and instead of being round as its predecessor, was oval or flattened on the sides, it was a fortunate thing that there was a thin scale of plate left upon the labial side when the socket was enough enlarged to receive the root. A black rubber splint capping the crowns was worn about four weeks, shielding that tooth from injury; no un-

usual results followed; it was speedily taken into fellowship without an unfavorable symptom. The right lower first bicuspid was much within the arch, and by forcing it out with a jack-screw it performed excellent service as a canine. By this operation, although not as good as the one first contemplated, this beautiful young lady is spared the uncomfortable and humiliating necessity of wearing an artificial appliance, and has her own home-grown natural teeth distributed where they will do the most good.—*Journal of the American Medical Association.*

ARTICLE V.

TREATMENT OF BLIND ABSCESES.

BY DR. LOUIS OTTOFY, CHICAGO.

The treatment of blind abscesses and the filling of root-canals and cavities with plastic material, all to be done at one sitting, naturally finds much opposition, it being a radical departure from common practice; however, the remedies now at hand for these purposes are such that in many instances it is justifiable.

Unless free access can be gained to all of the roots, the method is not to be relied on, as cleanliness is the cardinal principle of success. The rubber dam should be adjusted, and the *debris* from the cavity entirely removed before any attempt is made to enter the pulp-chamber. The root-canal once opened, they should never be bored, reamed, or any effort made to enlarge them; but instead, a good supply of fine piano wire instruments should be on hand. The canals are first *thoroughly* cleansed with ether and chloroform on cotton, never using such large pieces as to cause a pumping action toward the end of the root. These washings should be continued till neither odor or color is perceptible; however, in roots where the apex is large, which is readily

ascertained by the experienced hand, the cotton receives a slight yellowish tinge which does not cease, but this is no bar to proceeding with the treatment. After thorough cleansing, the peroxide of hydrogen is forced in, then the root-canals are again thoroughly dried, and a solution of bichlorate of mercury (1 to 1,000) is forced into and beyond the roots. The root-canals are again thoroughly dried, and with cotton moistened with eucalyptol and dipt into iodoform. These two powerful remedies are forced to occupy every available space in and beyond the canals, and while in that condition, the introduction of a solution of gutta-percha in chloroform, with iodoform (1 ounce of gutta-percha solution, 1 dram of iodoform), is immediately proceeded with. The root one-third or two-thirds filled with it, a cone of oxyphosphate is made, which acting as a piston, is forced into the canals, driving the gutta-percha beyond the root (possibly), at any rate, into every part. The filling (of gold, if not a large cavity), or with any of the plastics, may be immediately introduced. An application of a counter-irritant to the gums is then indicated, which may be either a mixture of equal parts of tincture of iodine and tincture of aconite root; or an iodine paint, which is iodine dissolved in alcohol, four times the strength of the officinal preparation. That either may be effective, the tissue to which this is applied must be dry. The patient is instructed to return within twenty-four hours if troubled. As a general rule, inflammation, sometimes severe, of three or four hours' duration, will follow this treatment. Three precautions should be observed.

1st. Do not select a patient who is lymphatic, anemic, and of such sluggish constitution that the system itself is not properly supported.

2d. Use nothing but pure and reliable remedies.

3d. Each step must be thoroughly performed before another is taken.—*Items of Interest.*

ARTICLE VI.

NEW METHOD OF MOUNTING AN ARTIFICIAL DENTURE.

BY H. W. HOWE, D. D. S.

Without entering into the discussion of the relative values of the different bases for artificial dentures, we assume that an incorruptible metallic one is the best. The two metals most acceptable are gold and platinum, and while the platinum plate with its continuous gum is the most artistic, still a case can be mounted on gold by a somewhat new method, which has all the merits of continuous gum except the gum color. It is a description of this process to which I invite your attention.

The impression casts and dies are obtained in the usual way, and after the plate has been swaged and articulation taken, the teeth, which must be of the recently introduced countersunk pattern, are arranged in their desired position and wax built about them in such a manner as shall best restore the contour of the face. After the teeth are in position and the wax well smoothed to the shape wanted in the finished case, carefully remove each tooth, partially fill up the depressions left in the wax, leaving sufficient rim to show where each tooth belongs. Now varnish the whole, and when dry take an impression of the palatine surface in sand; make dies of this surface, and stamp gold plate of same gauge as the original plate. This piece of gold will cover the wax on the palatine surface. After filing that portion of the rim that comes next the teeth to correspond to their interstices, the impression material is removed and the rim and plate soldered together; the holding of the two together can be greatly facilitated by riveting with fine gold wire, which after the soldering can be filed away. There is little danger of the plate warping, if it is heated uniformly with a blast blaze. It should, in soldering, rest steadily on

a piece of charcoal cut to fit it. After the soldering, the plate is filed and polished, and then replaced upon the articulation. Each tooth is now fitted to its position and re-articulated. The case is then flaked teeth down, exposing only a small portion of the wax rim. The procedure is now the same as in rubber work, the wax is boiled out and the space packed with pink rubber. Much artistic talent may now be displayed in the carving of the gum. After polishing and bleaching, the case is finished. It will rival continuous gum for beauty, while it is far stronger and more serviceable. A broken tooth is easily replaced in oxy-phosphate of zinc, in ten minutes.

The writer offers this method to the profession, believing it a substantial improvement on what has heretofore been attempted in gold work, and hopes it will meet with their approbation.—*Western Dental Journal*.

ARTICLE VII.

RUNYAN'S METHOD OF BRIDGE-WORK.

BY H. W. RUNYAN, D. D. S., EATON, OHIO.

There is no doubt that bridge-work is very valuable in many instances for partial dentures. But the great cost of the gold process places it within the reach of comparatively few, while there are fewer practitioners of dentistry that thoroughly understand the swaging and soldering of gold that is necessary in the construction of the gold bridge-work. The method here described will place it within the reach of all who can afford a plate of any kind, and it can be constructed by any one capable of making a vulcanite plate, and I think it will last as long as any bridge-work, or as long as the roots, to which it is attached, will last.

Process of Construction: For a case where the four incisors are missing and the cuspid roots remain:—

After cutting the cuspids down to, or a little above, the margin of the gum, prepare by drilling out the canal with an inverted cone bur, and then a pointed fissure bur. By so doing, a perfect funnel-shaped canal is formed, which gives strength to the work, and facilitates access to the end of the root. Take a platinum bar long enough to reach from one root to another, and bend at right angles to form the pins. Now set the bridge support in place, after bending to conform with the gums; and take the impression and articulation. Make the model, place on the articulator and wax on vulcanite teeth. Remove from the articulator, flask and vulcanize, after covering all the rubber with vulcanizable gold.

Gum teeth can be used for the bridge between the roots, if the alveolar process has been absorbed very much.

After vulcanizing, clean up and fasten in by placing a little cement on the pin that extends into the cavity formed by the fissure drill. The rubber will fill that part formed by the inverted cone.

Use the best rubber, run the vulcanizer up slowly to 300° Fah., and vulcanize for one hour and fifteen minutes. You will have "a thing of beauty, and a joy" to your patient and yourself.—*Ohio Journal of Dental Science.*

ARTICLE VIII.

EVOLUTION IN PATHOLOGY.

MAN'S LOST INCISORS.

In his lectures on "Evolution in Pathology," delivered at the Royal College of Surgeons of England, Mr. J. Bland Sutton, F. R. C. S., referring to the suppression of parts, said that one of the clearest instances of suppression, and at the same time one capable of indisputable demonstration, is connected with the disappearance and occasional reappear-

ance of a third incisor tooth in man. The matter was first worked out and announced by Professor Albrecht (now of Hamburg) in quite a number of papers, that normally man inherits three incisors on each side in the upper maxillæ, but during development the middle (second) one of the three is suppressed. In many cases of cleft palate, however, more room is afforded, and the usually suppressed tooth attains a functional condition. The question was one of importance, and I was able in a paper read before the Odontological Society of Great Britain in December, 1884, to confirm this part of Albrecht's observation. Professor Sir W. Turner, a month later, adduced also confirmatory testimony in the *Journal of Anatomy and Physiology*, and the last contribution in this direction is by Windle and Humphrey in the same journal. A careful analysis of the facts shows, beyond all doubt, that in the usual course of events an incisor tooth is suppressed in the upper maxilla of man; the only point admitting of any latitude of opinion is whether the missing tooth is the second or third incisor. As the case stands at present the balance of opinion is in favour of it being the second.

We must not forget, however, that supernumerary teeth are found in other situations than in the incisor series; indeed, they may occur in almost any part of the dental arch, and may vary in character from a perfectly formed enamel-covered tooth to a tiny conical mass of dentine. In determining whether an extra tooth is a supernumerary one or not, we must also take into consideration the fact that an excess in the number of teeth is occasionally due to the retention of one or more milk teeth. In order to comprehend the true significance of supernumerary teeth, it is necessary to bear in mind the morphology of these organs. In their essential features the teeth of a shark agree with those of a mammal, and in their development as calcified papillæ of the involuted epiblast in the buccal region—the stomodæum—the two forms are in perfect harmony. In the case of the shark almost the whole of the mouth is beset

with teeth, whereas in mammals they are normally restricted to certain very definite tracts. An unprejudiced survey of the facts ought to convince us that though the teeth of mammals are thus kept within narrow limits, yet the papillæ in the immediate vicinity of these teeth territories are potentially teeth, and it is perfectly consonant with what we know of the principles of atavism that these papillæ should occasionally declare their ancestry by developing as rudimentary, or even perfect, teeth. Nor is this form of atavism limited to this particular region; for, inasmuch as teeth are modified papillæ of the skin or integumental covering (and this may be absolutely demonstrated in the case of the young of the dog-fish, in whom the various stages may be clearly traced from placoid scales to teeth), so in those remarkable teratomata arising in obsolete canals lined with epiblastic tissues, calcified papillæ (teeth) make their appearance. Dentine and enamel are tissues which exist in scanty proportions in man, yet they formerly occurred in great abundance in the remarkable mailed-ganoids which are encased in an elaborate armour of these very extraordinary tissues.

If we admit the above opinions, then a rational explanation is forthcoming of certain interesting pathological conditions which occur in the mouth. For instance, some form of odontomata may be considered as aberrant involutions of buccal epiblast and papillæ; the view is supported by the fact that this variety of neoplasm occurs in many mammals. There is also good evidence to support the view that the milk dentition is to be regarded as a set of teeth appearing in obedience to the law of inheritance. In many mammals they are, like the lanugo of the human foetus, shed before the embryo quits the uterus. If supernumerary teeth can be regarded as atavistic, then we must consider certain pre-calcific stages of teeth in the same light; for instance, in the early stage a tooth consists of an up-growing papilla capped by a down-growth of epithelium. Suppose the development to advance no further, but growth to con-

tinue, the result is an aberrant formation—a neoplasm. Involution of this kind have been detected by Malassez, and Mr. Eve has discussed their relation in connection with multilocular cystic tumours of the jaws. The upshot of the argument is this: supernumerary teeth, odontomata (excluding the cemeptomata of herbivora), and multilocular cystic tumours of the jaws may be regarded as originating in the germs of teeth suppressed in the process of evolution of our species. The incisor tooth, to the consideration of which the early part of the argument was dedicated, may be considered, in all probability, as the last tooth in the order of suppression.

In addition to neoplasms originating in undeveloped enamel germs, we have to take into consideration a class of tumour usually described somewhat vaguely as adenomata, growing from the palate. Our knowledge of these cases is

much advanced by the work of Mr. Stephen Paget on this subject. It appears that neoplasms, perfectly innocent in their nature, but full of epithelial nests, occur in the palate, and there are good grounds for believing that many of the growths variously described as glandular, alveolar sarcoma, alveolar carcinoma (!), &c., have their origin in little round masses of epiblast, which become enclosed between the two horizontal plates, which fuse together in the median line in order to separate the nasal and buccal cavities. The existence of such isolated epithelial islets has been affirmed by more than one observer, and a good account of them, with references to the literature of the subject, will be found in Leboucq's papers on "Le Canal Naso-palatine chez l'Homme," and "Note sur les Perles Epitheliales de la Voûte Palatine."—*The London Dental Record*.

THE ILLINOIS STATE DENTAL SOCIETY.

The twenty-third annual meeting of the Illinois State Dental Society will be held at Jacksonville, beginning

Tuesday, May 10th and continuing four days. A full programme of scientific work is arranged for, including a large and instructive clinic. Dr. Black will give short lectures on micro-organisms with practical demonstration of their culture. All dentists will be cordially welcomed.

J. W. WASSALL,

Secretary.

MISSOURI STATE DENTAL SOCIETY.

The Missouri State Dental Association will hold its twenty-third annual meeting at Kansas City, Mo., the third Tuesday in June, continuing in session four days, June 21st and 24th inclusive.

J. G. HARPER, D. D. S.,

Recording Secretary.

WILLIAM CONRAD, D. D. S.,

President.

Editorial, Etc.

A SINGULAR AND INTERESTING CASE.—A short time ago a German—Gustav M———, aged 55 years, presented himself as a patient at the hospital of the University of Maryland, who claimed that after an attack of yellow fever in New Orleans, in 1853, the saliva gradually ceased to flow from the salivary glands, until his mouth became perfectly dry. Coincident with the suppression of the salivary secretion, his teeth began gradually to crumble away, until they were all destroyed. In 1861, being a soldier, an army surgeon administered to him a remedy which caused a partial return of the salivary secretion as long as it was used. But the nature of the remedy was unknown to the patient, and he was unable to learn its

name from the fact that the surgeon who administered it could not afterwards be found by him. The suppression of the saliva has continued from 1861, until the present time, when he presented himself at the hospital. On probing the duct of Steno, a very minute quantity of thick fluid escaped, and on the administration of the fluid extract of jaborandi, saliva was generated to such a degree that he could spit it from his mouth. The digestion of the patient continued good, according to his statement, notwithstanding no saliva was secreted; and the mouth was perfectly dry. The further treatment of this singular case will be regarded with interest.

HISTORY OF DENTISTRY.—Dr. E. P. Beadles in answer to a question pertaining to the early history of dentistry replied as follows:

Herodotus, 500 B. C., speaks of physicians for the teeth. The Egyptians were somewhat advanced in the science, as many filled teeth are found in the mouths of mummies. Celsus, who lived 100 B. C., recommended certain dental operations. So remote is the origin of dental surgery, and imperfect the history of ancient medicine, that we cannot trace it with any degree of certainty.

It was not until 1728 that a systematic treatment on Dental Surgery was published; this was a book of some nine hundred pages, written by Pierre Fanchard. Then followed works by Burou, Lecluse, Jourdain, and others.

The first dentist in the United States, of whom we have any account, was Mr. R. Wooffendale, who came over from England in the year 1766. Mr. John Greenwood however, was the first native American dentist. He practiced in New York about the year 1778.

Not until about 1820 do we find much progress in the science in the United States. From that period the advancement of dentistry has been marked. The first college of Dental Surgery was established in Baltimore in 1840. Since then, colleges have been established in all parts of the United States, leading the world in dental educational facilities.

This important branch of medicine has made especially

rapid strides during the last two decades. Many inventions and improved instruments, have rendered easy the oftentimes tedious and painful operations, these advantages with the intelligence and skill which may be now found in the profession, fully meet the demand for dental operations to prevent the loss of the important organs of mastication. The principle cause of the loss of teeth is pure neglect on the part of their owners. We Americans have worse teeth than the people of most other nations, simply because we do not take the time and trouble to consult a competent dental surgeon. We forget that we have teeth until an exposed pulp in some aching molar cries out for protection, then, when too late perhaps, we look for our friend the Dentist, and the chances are that the forceps have to be used, when if we had taken a little precaution the tooth might have been saved. Many persons seem to think that artificial teeth are "just as good" as those given by nature. I have only to say, try them. Hence we should not neglect the natural teeth thinking that we can easily have them replaced.

CHICAGO COLLEGE OF DENTAL SURGERY.—The Fifth Annual Commencement was held at the Grand Opera House, on Monday, March 28th, 1887, at 2:30 P. M.

The degrees were conferred by Dr. J. A. Swazey, President. The Faculty address by Professor A. W. Harlan, and the valedictory by James R. Pugin, D. D. S.

The following named gentlemen received the degree of Doctor of Dental Surgery :

Bacon, Dewitt Clinton,	Illinois
Ballard, Henry Cliff	Minnesota
Bentley, Charles Edwin	Wisconsin
Broadbent, Thomas Albert, B. S	Illinois
Calkins, Charles Dibble, M. D.	Illinois
Coltrin, Charles Wilkins	Illinois
Conn, Walter Scott	Illinois
Damon, William Henry	Illinois
Davis, Ernest Edward	Michigan
Deming, Charles Perry	Wisconsin
Dodge, Frank Armstrong	New York

Goodearle, Joseph Henry	Wisconsin
Hart, Edmund Jerome.....	Wisconsin
Haskins, George William.....	Illinois
Henderson, Luther David	Wisconsin
Keefe, James Eucharius	Illinois
Liggett, John	Illinois
Mawhinney, Elgion	Dakota Territory
Morris, William Evans.....	Illinois
Nelson, Arthur.....	Missouri
Norton, M. Eugene.....	Illinois
O'Brien, Henry.....	Illinois
Pagin, James Richard	Indiana
Pitt, Harry Norris.....	Illinois
Reed, John Henry	Wisconsin
Rosenkranz, Charles Christian.....	Illinois
Seeglitz, Otto Eberhardt.....	Illinois
Stover, Frank Garner.....	Illinois
Underwood, Chester James	Illinois
Wade, Harry Elmer	Illinois
Wadsworth, Henry Palmer.....	Illinois
Waschkuhn, Julius Albert.....	Illinois
Wermuth, Frank Charles.....	Wisconsin
West, George Nelson	Illinois
Wilson, Harry H.....	Illinois
Witt, William	Illinois
Zinn, Frank H	Wisconsin

Bibliographical.

THE AMERICAN SYSTEM OF DENTISTRY.—In treatises by various authors. Edited by Wilbur F. Litch, M. D., D. D. S. Volume II, *Operative and Prosthetic Dentistry*, with one thousand and thirty-five illustrations. Publishers: Lea Brothers & Co., Philadelphia, Pa., 1887.

The second volume of this excellent work has been pub-

lished in the same superior style as the first, and to many it will prove to be more interesting on account of its practical treatises.

The contributors and subjects are "The Stopping Process with Gold, and the Relative Procedures," by Louis Jack, D. D. S. "The Herbst Method of Filling Teeth," by C. F. W. Boedecker, D. D. S. "Plastic Materials for Filling Teeth," by A. G. Bennett, D. D. S. "Electro-Chemical Relations of Stoppings to the Teeth," by S. B. Palmer, D. D. S. "Calcareous Deposits on the Teeth," by A. W. Harlan, M. D., D. D. S. "Discolored Teeth and their Treatment," by James Truman, D. D. S. "Orthodontia," by S. H. Guilford, D. D. S. "Replantation and Transplantation of the Teeth," by George W. Weld, M. D., D. D. S. "Extraction of Teeth," by Thos. C. Stellwagen, M. D., D. D. S. "Taking Impressions of the Mouth," "Plaster Models," "Antagonizing and Contour Models," by A. G. Bennett, D. D. S. "Articulation of the Human Teeth," "The Anatomical Articulator," by W. G. A. Bonwill, D. D. S. "Metallic Dies and Counter-Dies," by William H. Truman, D. D. S. "Artificial Dentures on Bases of Gold and Silver," by William H. Truman, D. D. S. "Continuous Gum Work," by D. D. Smith, M. D., D. D. S. "Artificial Dentures on Bases of Fusible Alloys," by Theodore F. Chupein, D. D. S. "Artificial Dentures on Rubber Base," by A. P. Beale, D. D. S. "Celluloid and Zylonite," by W. W. Evans, M. D., D. D. S. "Artificial Crowns," (Pivot Teeth), by William H. Truman, D. D. S. "A System of All-Porcelain Crown Substitution," by W. G. A. Bonwill, D. D. S. "Crown-and-Bridge-Work," by Wilbur F. Litch, M. D., D. D. S. "Metallic Facings for Carious Crowns," by Wilbur F. Litch, M. D., D. D. S. "Moulding and Carving Porcelain Teeth," by William R. Hall, D. D. S. "The Hygienic Relations of Artificial Dentures," by Edw. C. Kirk, D. D. S. "Dental and Facial Types," by Robt. S. Ivy, D. D. S. "Obturators and Artificial Vela," by Henry A. Baker, D. D. S. Among other interesting articles the Third Volume will contain one on Oral Surgery by Prof. J. McLane Tiffany, Professor of Oral Surgery in the University of Maryland Dental Department.

The third volume will complete the "System," and all will comprise a work of great value to the dental library of every practicing dentist.

LIBRARY Monthly Summary

RESORCIN INOCULATIONS IN PHLEGMON.—Dr. Ludwig Weiss, of New York, *Medical Record*, recommends very highly resorcin inoculations in Phlegmon, especially of the fingers. He claims it is an effective remedy in all furuncular and phlegmonous inflammations; it abates the inflammation, if used in time, by destroying the germ locally, as well as in the lymph canals leading from the point of infection, at the same time acting as an anæsthetic on the sensitive terminal nerve filaments. Dr. Weiss makes a number of shallow, parallel incisions through the integument into and around the lesion, then applies a thick layer of 10 to 30 per cent. resorcin lanoline ointment, then a piece of lint smeared with the ointment, then gutta-percha tissue, absorbent cotton, and a moist gauze bandage. The resorcin ointment must be applied abundantly and continuously. The ointment must be renewed twice daily. Relief from pain and tension ensues in from six to twelve hours.

SEDATIVE COUGH MIXTURE.—When Dr. H. C. Wood recommends anything it is a guarantee of its merit. Hence we take the following from the *Therapeutic Gazette*:

Potassi citratis.....1 drachm.

Succi limonis.....2 drachms.

Syr. ipecac..... $\frac{1}{2}$ ounce.

Syr. simplicis.....6 ounce.

A tablespoonful from 4 to 6 times a day.

When there is much cough or irritability of the bowels, paregoric may be added.

WARTS.—The *Medical Press* says: "It is fairly established that the common wart, which is so unsightly and often

so proliferous on the hands and face, can be easily removed by small doses of sulphate of magnesia taken internally. M. Colrat, of Lyons, has drawn attention to this extraordinary fact. Several children treated with three-grain doses of Epsom salts, morning and evening, were promptly cured. M. Aubert cites the case of a woman whose face was disfigured by these excrescences and who was cured in a month by a drachm and a half of magnesia taken daily. Another medical man reports a case of very large warts which disappeared in a fortnight from the daily administration of ten grains of salts."

The following formula, a modification of that recommended by M. Vigier for corns, is largely used by Vidal for warts:

Acid, salicylic	1 gramme.
Alcohol, 90°	1 "
Ether	2½ "
Collodion	5 "

The solution should be painted over the affected surface each day.

GRIND IT OFF.—Should a devitalized tooth, after having been filled, become sore to the touch, rendering occlusion of the jaws painful, there is no better remedy than to grind away the tooth sufficiently to prevent occlusion. We have, in this way, several times prevented what promised to be severe periodontitis.—Dr. Catching, in *Southern Dental Journal*.

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